BLACK & VEATCH Waste Science, Inc.

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U.S. Environmental Protection Agency
Treatment Plant/Oil Services Company
Work Assignment 12

BVWS Project 52012.545
April 17, 1995

9/21/95
NFGAO

Mr. Narindar Kumar, Chief
Site Assessment Section
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

RECD.
SEP 21 1995

Subject: Site Inspection Prioritization
Treatment Plant/Oil Services Company
Columbia, Maury County, TN
EPA ID TND980515779

Dear Mr. Kumar:

BLACK & VEATCH Waste Science, Inc. (Black & Veatch) has been tasked by the U.S. Environmental Protection Agency (EPA) to conduct a Site Inspection Prioritization (SIP) for the Treatment Plant/Oil Services Company (Treatment Plant) site in Columbia, Maury County, Tennessee. In accordance with the scope of work, a preliminary Hazard Ranking System (HRS) score was prepared to determine the need for future activities at the site.

The Treatment Plant site is located on Santa Fe Pike in the northern section of the city of Columbia, Tennessee (Refs. 1; 2; 3). The Duck River is located approximately 0.1 mile to the east of the onsite waste sources (Ref. 1). The facility is the former City of Columbia Sewage Treatment Plant. The Treatment Plant site operated as a wastewater treatment plant for soluble oil, and is no longer an active facility; however, records vary regarding the property ownership and the duration of the operational period at the facility (Refs. 4; 5). Site Assessments performed by EPA in 1983 and 1984 indicate that the site began operations in 1980 (Refs. 2; 3). However, a letter dated in 1979 indicates that the Oil Services Company was cited in 1979 for violation of the city's sewer use ordinance for discharging untreated waste materials into the sewage treatment plant (Refs. 4; 6; 7).

Operations at the facility consisted of treatment of soluble waste oil, which included the processing of a waste sludge, and treatment of waste water which was discharged into the municipal water system. The Treatment Plant facility accepted waste oil from a wide variety of customers, with a large volume of their waste generated from electroplating and degreasing operations (Ref. 4). The waste products were initially run through a series of settling tanks and treatment systems to separate the oil and water, remove metals, and eliminate organics through biodegradation (Refs. 4; 8). The resulting sludges were contained in drums and disposed of offsite. Non-hazardous sludge was disposed of in licensed landfills, and hazardous sludges were disposed of in permitted hazardous waste landfills (Refs. 4; 8). The facility conducted its own periodic testing of the wastestreams, and possessed a National Pollution Discharge Elimination System (NPDES) permit which allowed for the treated wastewater to be discharged into the municipal water system (Ref. 4). Records indicate that this effluent was periodically tested, but it is not known how often testing was performed (Refs. 3, p. 5; 9). Wastes contained at the facility include wastewater and oil sludges which commonly contain cadmium, chrome, copper, lead, nickel, silver, zinc, benzene, toluene, xylene, 1,1,1-trichloroethane, trichloroethylene, and polychlorinated biphenyls (Refs. 2; 3, p. 1; 4, pp. 2, 3; 8; 10, pp. 2-6).

File information is limited regarding previous investigations at the Treatment Plant facility. A Preliminary Assessment (PA) was conducted at the facility by the Tennessee Department of Health & Environment, Division of Solid Waste (DSWM) in December 1983. The PA indicated that of the 200,000 gallons of waste oil which were stored onsite, 100,000 gallons were treated daily (Ref. 2). A Site Inspection (SI) was conducted by DSWM personnel in April 1984. The SI reported that waste oil was contained in concrete basins onsite. No environmental samples were collected as part of the investigation (Ref. 3). Since the time of the last investigations, the facility has ceased operations (Refs. 4; 7; 11). The tanks which were previously used in the separation process have either been filled or removed, and all buildings previously onsite have been demolished (Ref. 11). No known testing has been conducted at the site since its closing. Currently, the land at the former facility is not being utilized (Ref. 11).

Potable water within a 4-mile radius of the Treatment Plant facility is supplied primarily by Columbia Power and Water (CPW), which currently serves approximately 15,500 connections in the city of Columbia and the surrounding areas. The entire CPW water supply is obtained from one intake on the Duck River, which is located approximately 1 mile upstream from the Treatment Plant site (Refs. 1; 12). Residents who are not serviced by the CPW system utilize private wells or springs in the area which tap into the shallow aquifers of the Mississippian

limestone of the Central Basin. The water table in this area is usually encountered at a depth of less than 200 feet below land surface (bls) (Refs. 13, pp. 2-10, 13; 14, pp. 5-14; 15). The estimated population within a 4-mile radius of the site that uses groundwater for drinking water is approximately 128 people, radially distributed as follows: 0 - 0.25 mile, 0 persons; 0.25 - 0.50 mile, 0 persons; 0.50 - 1 mile, 0 persons; 1 - 2 miles, 21 persons; 2 - 3 miles, 34 persons; 3 - 4 miles, 73 persons (Refs. 1; 16; 17).

Runoff from the Treatment Plant facility flows overland approximately 600 feet eastward, where it enters the Duck River (Ref. 1). The surface water pathway continues for 15 miles along the Duck River (Refs. 1; 18). There are approximately 3 miles of wetland frontage located along the surface water pathway (Ref. 18). The average annual flow for the Duck River is approximately 2,094 cubic feet per second (cfs) (Ref. 19). There are no surface water intakes along the surface water pathway (Ref. 12). The Duck River serves as a habitat for the birdwing pearly mussel (*Conradilla caelata*) and the Cumberland monkeyface pearly mussel (*Quadrula intermedia*). The ranges of other threatened or endangered species may include portions of the Duck River; however, exact locations of the habitat for these species have not been identified (Ref. 20). The Duck River is commonly used for recreational fishing and boating in the Columbia area (Ref. 12).

There are approximately 12,538 residents within a 4-mile radius of the Treatment Plant site, radially distributed as follows: 0 - 0.25 mile, 76 persons; 0.25 - 0.50 mile, 506 persons; 0.50 - 1 mile, 2,916 persons; 1 - 2 miles, 4,727 persons; 2 - 3 miles, 3,349 persons; 3 - 4 miles, 964 persons (Refs. 1; 16; 21; 22). The nearest residence is located 0.1 mile from the site. There are no known residents, schools, daycare facilities or commercial agriculture operations located within 200 feet of the waste sources onsite (Ref. 1). Approximately 74 acres of wetlands are located within the 4-mile radius of the site (Refs. 1; 18; 23). No threatened or endangered species have been positively identified within a 4-mile radius of the site (Ref. 20).

Due to the low potential for contamination and limited number of targets, no further action at the Treatment Plant/Oil Services Company site is recommended.

Attached are all references used in this evaluation. If you have any questions or comments, please contact me at (215) 928-2207 or Victor Blix at (404) 643-2320.

Very truly yours,

BLACK & VEATCH Waste Science, Inc.

Michael Ferrari
Site Manager

enclosure

cc: Victor Blix, BVWS-Atlanta

REFERENCES

1. U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 minute series Topographical Quadrangle Maps of Tennessee: Godwin, TN, 1988; Carter's Creek, TN, 1982; Columbia, TN, 1989; Glendale, TN, 1981. Scale 1:24,000.

2. Environmental Protection Agency, Potential Hazardous Waste Site, Preliminary Assessment, for Oil Services Co./Treatment Plant, December 16, 1983.

3. Environmental Protection Agency, Potential Hazardous Waste Site, Site Inspection Report, for Oil Services Co./Treatment Plant, April 9, 1984.

4. Michael Ferrari, Black & Veatch Waste Science, Inc., in memorandum to Treatment Plant/Oil Services Co. File, dated February 10, 1995. Subject: Waste Treatment.

5. Memorandum; Superfund Site Master List, August 8, 1983. Subject: Three sites on Master List involve Harris'/Oil Services Company Operations.

6. Letter to Mr. Michael Stone, Director of Sewer Services, City of Columbia, dated May 22,1979. Subject: Oil Services Company, Deposition of Waste Oil.

7. Michael Ferrari, Black & Veatch Waste Science, Inc., in memorandum to Treatment Plant/Oil Services Co. File, dated February 9, 1995. Subject: Facility Status.

8. Oil Services Company, Description of Waste Treatment Processes, undated.

9. Ruth Yates, Tennessee Department of Public Health, in office correspondence to files, dated August 4, 1980. Subject: Phone Conversation with Ken Harris, Oil Service Company.

10. N. Irving Sax and Richard J. Lewis, Sr., (eds.) Hawley's Condensed Chemical Dictionary. New York: Van Nostrand Reinhold.

11. Michael Ferrari, Black & Veatch Waste Science, Inc., in memorandum to Treatment Plant/Oil Services Co. File, dated February 10, 1995. Subject: Facility Status (2).

12. Michael Ferrari, Black & Veatch Waste Science, Inc., in memorandum to Treatment Plant/Oil Services Co. File, dated February 13, 1995. Subject: Columbia Power & Water Service Area.

13. Roy Newcome, Jr., State of Tennessee, Department of Conservation, Division of Geology, Ground Water in the Central Basin of Tennessee, Report of Investigations Nº 4, 1958.

14. Charles V. Theis, U.S. Department of the Interior and Tennessee Division of Geology, Ground Water in South-Central Tennessee, Water Supply Paper 677, 1936.

15. Tennessee Department of Environment and Conservation, Division of Water Supply, Records of Water Wells in Selected Areas of Tennessee, December 1, 1994.

16. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Summary Population and Housing Characteristics, Tennessee, 1991 CPH-1-44 (Washington, D.C.: GPO, 1991).

17. Michael Ferrari, Black & Veatch Waste Science, Inc., in memorandum to Treatment Plant/Oil Services Co. File, dated February 13, 1995. Subject: Population served by groundwater.

18. U.S. Department of the Interior, National Wetland Inventory Maps, 7.5 minute series, Quadrangles for Godwin, TN, 1988; Williamsport, TN, 1981.

19. U.S. Geological Survey, Water Resources Data, Tennessee, Water Year 1992, U.S. Geological Survey Water-Data Report TN-92-1.

20. U.S. Fish and Wildlife Service, Southeast Region, Endangered & Threatened Species of the Southeast United States, January 1992.

21. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Data Base, compiled from U.S. Bureau of the Census data (1990).

22. Michael Ferrari, Black & Veatch Waste Science, Inc., in memorandum to Treatment Plant/Oil Services Co. File, dated February 13, 1995. Subject: Population within 4 mile radius.

23. Michael Ferrari, Black & Veatch Waste Science, Inc., in memorandum to Treatment Plant/Oil Services Co. File, dated February 10, 1995. Subject: Wetlands within 4 miles of site.

CONFIDENTIAL

Hazard Ranking System Preliminary Score

for

Treatment Plant/Oil Services Company

Columbia, Maury County, Tennessee

EPA ID TND980515779

The preliminary HRS score for the Treatment Plant/Oil Services Co. site was calculated using the SI Worksheets. Pathways evaluated include air migration, soil exposure, surface water migration, and groundwater migration. The score reflects a Hazardous Waste Quantity value of 100 for all pathways, based on the estimated volume of the waste onsite (200,000 gallons). The volume of onsite waste was obtained from an investigation of the site conducted in 1983. Waste characteristic values were derived based on a potential release of contaminants commonly associated with oil sludges and include the following: cadmium, chromium, copper, lead, nickel, silver, zinc, benzene, toluene, xylene, 1,1,1-trichloroethane, trichloroethylene, and PCBs.

Although no environmental samples have been collected from this site, an observed release to groundwater, surface water, and soil, and potential release to air was assumed. This assumed observed release is representative of a "worst case" scenario. The groundwater pathway was scored based on an observed release to the shallow aquifers of the Mississippian limestone of the Central Basin. There is a low number of potential targets obtaining water from this formation. The surface water migration pathway HRS score was based on an observed release to the Duck River, and a potential for contamination to fisheries. The surface water pathway was the primary influence on the site score. The soil exposure pathway HRS score was based on an observed release to soils. The soil exposure pathway score is very low due to the lack of persons on or nearby the site. The air pathway HRS score was based upon a potential to release and a target value derived from potential populations and sensitive environments.

The limited use of groundwater for drinking water and the high dilution weight for the Duck River yields a low site score. Based on the findings of this report, the site score is below the 28.5 scoring threshold; therefore, no further action at this site is recommended.

HRS SCORING SUMMARY

S_{gw}	=	5.57
S_{sw}	=	43.77
S_{so}	=	0.01
S_{air}	=	6.32

Overall Score = 22.29

HRS Scoresheets

Site Name: *Treatment Plant/Oil Services Company*
Location: *Columbia, TN*

GROUNDWATER MIGRATION PATHWAY SCORESHEET

Likelihood of Release to an Aquifer	Maximum Value	Assigned Value
1. Observed Release	550	550
2. Potential to Release		
2a. Containment	10	0
2b. Net Precipitation	10	0
2c. Depth to Aquifer	5	0
2d. Travel Time	35	0
2e. Potential to Release (lines 2a x (2b+2c+2d)	500	0
3. Likelihood of Release (higher of lines 1 and 2e.)	550	**550**
Waste Characteristics		
4. Toxicity/Mobility	a	10000
5. Hazardous Waste Quantity	a	100
6. Waste Characteristics	100	**32**
Targets		
7. Nearest Well	50	20
8. Population		
8a. Level I Concentrations	b	0
8b. Level II Concentrations	b	0
8c. Potential Contamination	b	6.1
8d. Population (lines 8a+8b+8c)	b	6.1
9. Resources	5	0
10. Wellhead Protection Area	20	0
11. Targets (lines 7+8d+9+10)	b	**26.1**
Groundwater Migration Score for an Aquifer		
12. Aquifer Score [(lines 3 x 6 x 11)/82,500]	100	**5.57**
Groundwater Migration Pathway Score		
13. Pathway Score (Sgw) - Highest value for all aquifers evaluated	100	**5.57**

a Maximum value applies to waste characteristics category
b Maximum value not applicable
c Do not round to nearest integer

Site Name: *Treatment Plant/Oil Services Company*
Location: *Columbia, TN*

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

DRINKING WATER THREAT

Likelihood of Release	Maximum Value	Assigned Value
1. Observed Release	550	550
2. Potential Release by Overland Flow		
2a. Containment	10	0
2b. Runoff	25	0
2c. Distance to Surface Water	25	0
2d. Potential to Release by Overland Flo lines 2a x (2b + 2c)	500	0
3. Potential to Release by Flood		
3a. Containment	10	0
3b. Flood Frequency	50	0
3c. Potential to Release by Flood (Lines 3a x 3b)	500	0
4. Potential to Release (lines 2d + 3c)	500	0
5. Likelihood of Release (Higher of lines 1 and 4)	550	**550**
Waste Characteristics		
6. Toxicity/Persistence	a	1E+04
7. Hazardous Waste Quantity	a	100
8. Waste Characteristics	100	**32**
Targets		
9. Nearest Intake	50	0
10. Population		
10a. Level I Concentrations	b	0
10b. Level II Concentrations	b	0
10c. Potential Contamination	b	0
10d. Population (lines 10a+10b+10c)	b	0
11. Resources	5	5
12. Targets (lines 9+10d+11)	b	**5**
Drinking Water Threat Score		
13. Drinking Water Threat Score [(lines 5 x 8 x 12)/82500)]	100	**1.07**

a Maximum value applies to waste characteristics category
b Maximum value not applicable
c Do not round to nearest integer

Site Name: *Treatment Plant/Oil Services Company*
Location: *Columbia, TN*

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (continued)

HUMAN FOOD CHAIN THREAT

	Maximum Value	Assigned Value
Likelihood of Release		
14. Likelihood of Release (Same as line 5)	550	**550**
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	a	5E+08
16. Hazardous Waste Quantity	a	100
17. Waste Characteristics	1000	**320**
Targets		
18. Food Chain Individual	50	0
19. Population		
19a. Level I Concentrations	b	0
19b. Level II Concentrations	b	0
19c. Potential Human Food Chain Contam	b	20
19d. Population (lines 19a+19b+19c)	b	20
20. Targets (lines 18+19d)	b	**20**
Human Food Chain Threat Score		
21. Human Food Chain Threat Score [(lines 14 x 17 x 20)/82500)]	100	**42.670**

a Maximum value applies to waste characteristics category
b Maximum value not applicable
c Do not round to nearest interger

Site Name: *Treatment Plant/Oil Services Company*
Location: *Columbia, TN*

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (continued)

ENVIRONMENTAL THREAT

Likelihood of Release	Maximum Value	Assigned Value
22. Likelihood of Release (Same as line 5)	550	**550**
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioaccumulation	a	5E+08
24. Hazardous Waste Quantity	a	100
25. Waste Characteristics	1000	**320**
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	b	0
26b. Level II Concentrations	b	0
26c. Potential Environmental Contamination	b	0.0175
26d. Population (lines 26a+26b+26c)	b	0.0175
27. Targets (value on lines 26d)	b	**0.0175**
Environmental Threat Score		
28. Environmental Threat Score [(lines 22 x 25 x 27)/82500)]	60	**0.037**

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE - WATERSHED

29. Watershed Score (Lines 13 +21+28)	100	**43.77**

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE - WATERSHED

30. Watershed Score (Highest of all watersheds)	100	**43.77**

a Maximum value applies to waste characteristics category
b Maximum value not applicable
c Do not round to nearest interger

Site Name: *Treatment Plant/Oil Services Company*
Location: *Columbia, TN*

SOIL EXPOSURE PATHWAY SCORESHEET

RESIDENT POPULATION THREAT

Likelihood of Exposure	Maximum Value	Assigned Value
1. Likelihood of Exposure	550	**550**
Waste Characteristics		
2. Toxicity	a	10000
3. Hazardous Waste Quantity	a	100
4. Waste Characteristics	100	**32**
Targets		
5. Resident Individual	50	0
6. Resident Population		
6a. Level I Concentrations	b	0
6b. Level II Concentrations	b	0
6c. Resident Population (lines 6a+6b)	b	0
7. Workers	15	0
8. Resources	5	0
9. Terrestrial Sensitive Environments	c	0
10. Targets (lines 5+6c+7+8+9)	b	**0**
Resident Population Threat Score		
11. Resident Population Threat [(lines 1 x 4 x 10)/82500)]	b	**0.00**

a Maximum value applies to waste characteristics category
b Maximum value not applicable
c No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to a max of 60.

Site Name: *Treatment Plant/Oil Services Company*
Location: *Columbia, TN*

SOIL EXPOSURE PATHWAY SCORESHEET (continued)

NEARBY POPULATION THREAT

Likelihood of Exposure	Maximum Value	Assigned Value
12. Attractiveness/Accessibility	100	10
13. Area of Contamination	100	40
14. Likelihood of Exposure	500	5
Waste Characteristics		
15. Toxicity	a	10000
16. Hazardous Waste Quantity	a	100
17. Waste Characteristics	100	**32**
Targets		
18. Nearby Individual	1	1
19. Population Within One Mile	b	1.8
20. Targets (lines 18+19)	b	**2.8**
Nearby Population Threat Score		
21. Nearby Population Threat [(lines 14 x 47 x 20)/82500)]	b	**0.01**

SOIL EXPOSURE PATHWAY SCORE

22. Soil Exposure Pathway Score (Ss) (Lines 11 + 21)	100	**0.01**

a Maximum value applies to waste characteristics category
b Maximum value not applicable
c No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to a max of 60.

Site Name: *Treatment Plant/Oil Services Company*
Location: *Columbia, TN*

AIR MIGRATION PATHWAY SCORESHEET

Likelihood of Release	Maximum Value	Assigned Value
1. Observed Release	550	0
2. Potential to Release		
2a. Gas Potential to Release	500	500
2b. Particulate Potential to Release	500	500
2e. Potential to Release (Higher of lines 2a and 2b)	500	500
3. Likelihood of Release (higher of lines 1 and 2e.)	a	**500**
Waste Characteristics		
4. Toxicity/Mobility	a	10000
5. Hazardous Waste Quantity	a	100
6. Waste Characteristics	100	**32**
Targets		
7. Nearest Individual	50	20
8. Population		
8a. Level I Concentrations	b	0
8b. Level II Concentrations	b	0
8c. Potential Contamination	b	10.67
8d. Population (lines 8a+8b+8c)	b	10.67
9. Resources	5	0
10. Sensitive Environments		
10a. Actual Contamination	c	0
10b. Potential Contamination	c	1.897
10c. Sensitive Environments (lines 10a+10b)	c	1.897
11. Targets (lines 7+8d+9+10c)	b	**32.567**
Air Migration Pathway Score		
12. Pathway Score (Sa) [(lines 3 x 6 x 11)/82500]	100	**6.32**

a Maximum value applies to waste characteristics category
b Maximum value not applicable
c No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to a max of 60.

HRS Scoresheets

Site Name: *Treatment Plant/Oil Services Company*
Location: *Columbia, TN*

SITE SCORING SUMMARY

Groundwater Migration Pathway Score	5.57
Surface Water Migration Pathway Score	43.77
Soil Exposure Migration Pathway Score	0.01
Air Migration Pathway Score	6.32
Overall Site Score	22.29

APPENDIX C

SITE INSPECTION WORKSHEETS

This appendix consists of worksheets that can be used to generate an SI site score. Completion of these worksheets is not required, but the SI investigator must evaluate an SI score, either by these worksheets, *PREscore*, or other Regional scoring tools.

The worksheets consist of instructions and data tables to be filled in with scores from HRS reference tables. The data tables may also call for Data Type and References.

DATA TYPE: The Data Type columns should be filled in with an H, Q, or + if the data are HRS quality and well documented. The Data Type column should be filled in with an E, X, or - if the data represent estimates, approximations, or are not fully documented. This type identifies data gaps for the expanded SI to investigate.

REFERENCES: The Reference columns should be filled in with coded reference numbers. The numbered reference list should be attached or the numbering should be cross-referenced to the SI Narrative Report.

The SI investigator will need the current Superfund Chemical Data Matrix (SCDM) OSWER Directive 9345.1-13 (revised semi-annually) to complete these worksheets.

TABLE 3-1
GROUND WATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned	
Likelihood of Release to an Aquifer			
1. Observed Release	550	550	
2. Potential to Release			
2a. Containment	10		
2b. Net Precipitation	10		
2c. Depth to Aquifer	5		
2d. Travel Time	35		
2e. Potential to Release [lines 2a x (2b + 2c + 2d)]	500		
3. Likelihood of Release (higher of lines 1 and 2e)	550		550
Waste Characteristics			
4. Toxicity/Mobility	a		
5. Hazardous Waste Quantity	a		
6. Waste Characteristics	100		
Targets			
7. Nearest Well	50		
8. Population			
8a. Level I Concentrations	b		
8b. Level II Concentrations	b		
8c. Potential Contamination	b		
8d. Population (lines 8a + 8b + 8c)	b		
9. Resources	5		
10. Wellhead Protection Area	20		
11. Targets (lines 7 + 8d + 9 + 10)	b		
Ground Water Migration Score for an Aquifer			
12. Aquifer Score [(lines 3 x 6 x 11)/82,500][c]	100		
Ground Water Migration Pathway Score			
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100		

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.

TABLE 3-2
CONTAINMENT FACTOR VALUES FOR GROUND WATER MIGRATION PATHWAY

All Sources (except surface impoundments, land treatment, containers, and tanks)	Assigned Value
Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures).	10
No liner.	10
No evidence of hazardous substance migration from source area, a liner, and:	
(a) None of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system, or (3) functioning leachate collection and removal system immediately above liner.	10
(b) Any one of the three items in (a) present.	9
(c) Any two of the items in (a) present.	7
(d) All three items in (a) present plus a functioning ground water monitoring system.	5
(e) All items in (d) present, plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area.	3
No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, functioning ground water monitoring system, and:	
(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained run-on control system and runoff management system, or (3) no or nonmaintained engineered cover.	3

TABLE 3-2 (Continued)

All Sources (Concluded)	Assigned Value
(g) None of the deficiencies in (f) present.	0
Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present.	0

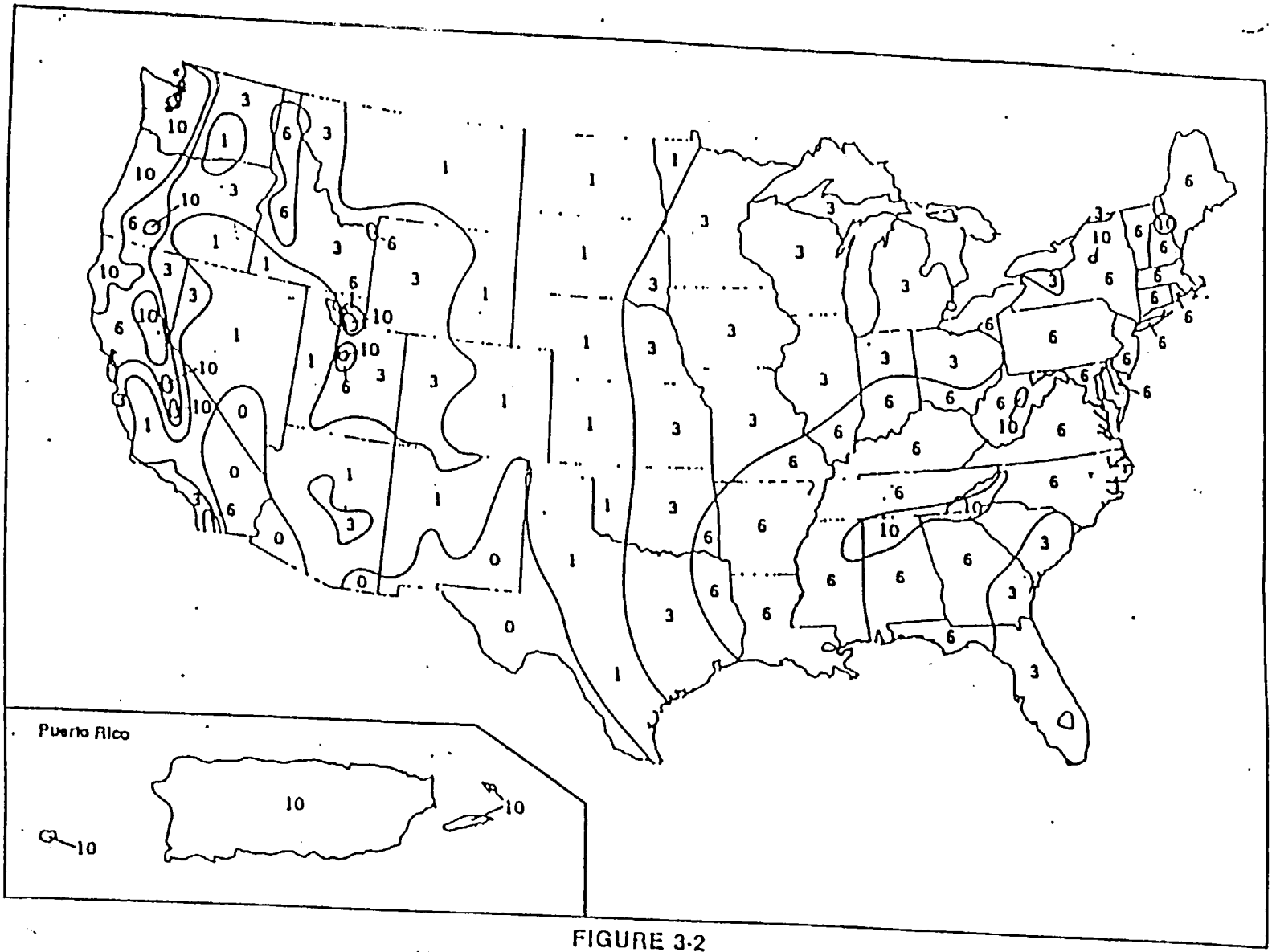

FIGURE 3-2
NET PRECIPITATION FACTOR VALUES

TABLE 3-5
DEPTH TO AQUIFER FACTOR VALUES

Depth To Aquifer[a] (feet)	Assigned Value
Less than or equal to 25	5
Greater than 25 to 250	3
Greater than 250	1

[a]Use depth of all layers between the hazardous substances and aquifer. Assign a thickness of 0 feet to any karst aquifer that underlies any portion of the sources at the site.

TABLE 3-6
HYDRAULIC CONDUCTIVITY OF GEOLOGIC MATERIALS

Type of Material	Assigned Hydraulic Conductivity[1] (cm/sec)
Clay; low permeability till (compact unfractured till); shale; unfractured metamorphic and igneous rocks	10^{-8}
Silt; loesses; silty clays; sediments that are predominantly silts; moderately permeable till (fine-grained, unconsolidated till, or compact till with some fractures); low permeability limestones and dolomites (no karst); low permeability sandstone; low permeability fractured igneous and metamorphic rocks	10^{-6}
Sands; sandy silts; sediments that are predominantly sand; highly permeable till (coarse-grained, unconsolidated or compact and highly fractured); peat; moderately permeable limestones and dolomites (no karst); moderately permeable sandstone; moderately permeable fractured igneous and metamorphic rocks	10^{-4}
Gravel; clean sand; highly permeable fractured igneous and metamorphic rocks; permeable basalt; karst limestones and dolomites	10^{-2}

[1]Do not round to nearest integer.

TABLE 3-7
TRAVEL TIME FACTOR VALUES[a]

Hydraulic Conductivity (cm/sec)	Thickness of Lowest Hydraulic Conductivity Layer(s)[b] (feet)			
	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Greater than or equal to 10^{-3}	35	35	35	25
Less than 10^{-3} to 10^{-5}	35	25	15	15
Less than 10^{-5} to 10^{-7}	15	15	5	5
Less than 10^{-7}	5	5	1	1

[a]If depth to aquifer is 10 feet or less or if, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

[b]Consider only layers at least 3 feet thick. Do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

TABLE 4-1
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned
DRINKING WATER THREAT		
Likelihood of Release		
1. Observed Release	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	____ from p. C-23A½
2b. Runoff	25	____ from p. C-23E
2c. Distance to Surface Water	25	____ from p. C-23F
2d. Potential to Release by Overland Flow (lines 2a x [2b + 2c])	500	____
3. Potential to Release by Flood		
3a. Containment (Flood)	10	____ from p. C-23F½
3b. Flood Frequency	50	____ from p. C-23G
3c. Potential to Release by Flood (lines 3a x 3b)	500	____
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	____
5. Likelihood of Release (higher of lines 1 and 4)	550	550
Waste Characteristics		
6. Toxicity/Persistence	a	____
7. Hazardous Waste Quantity	a	____
8. Waste Characteristics	100	____
Targets		
9. Nearest Intake	50	____
10. Population		
10a. Level I Concentrations	b	____
10b. Level II Concentrations	b	____
10c. Potential Contamination	b	____
10d. Population (lines 10a + 10b + 10c)	b	____
11. Resources	5	____

Jordan

TABLE 4-2
CONTAINMENT FACTOR VALUES
FOR SURFACE WATER MIGRATION PATHWAY

All Sources (except surface impoundments, land treatment, containers, and tanks)	Assigned Value
Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures).	10
No evidence of hazardous substance migration from source area and:	
(a) Neither of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system.	10
(b) Any one of the two items in (a) present.	9
(c) Any two of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system, or (3) liner with functioning leachate collection and removal system immediately above liner.	7
(d) All items in (c) present.	5
(e) All items in (c) present, plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area.	3
No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, and:	
(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained run-on control system and runoff management system, or (3) no or nonmaintained engineered cover.	3
(g) None of the deficiencies in (f) present.	0

TABLE 4-3
DRAINAGE AREA VALUES

Drainage Area (acres)	Assigned Value
Less than 50	1
50 to 250	2
Greater than 250 to 1,000	3
Greater than 1,000	4

* drainage area is area that contributes to overland flow across a source based on observing topographic map of the area.

TABLE 4-4
SOIL GROUP DESIGNATIONS

Surface Soil Description	Soil Group Designation
Coarse-textured soils with high infiltration rates (for example, sands, loamy sands)	A
Medium-textured soils with moderate infiltration rates (for example, sandy loams, loams)	B
Moderately fine-textured soils with low infiltration rates (for example, silty loams, silts, sandy clay loams)	C
Fine-textured soils with very low infiltration rates (for example, clays, sandy clays, silty clay loams, clay loams, silty clays); or impermeable surfaces (for example, pavement)	D

get info from Soil Survey

TABLE 4-5
RAINFALL/RUNOFF VALUES

2-Year, 24-Hour Rainfall (inches)	Soil Group Designation			
	A	B	C	D
Less than 1.0	0	0	2	3
1.0 to less than 1.5	0	1	2	3
1.5 to less than 2.0	0	2	3	4
2.0 to less than 2.5	1	2	3	4
2.5 to less than 3.0	2	3	4	4
3.0 to less than 3.5	2	3	4	5
3.5 or greater	3	4	5	6

Rainfall frequency atlas

TABLE 4-6
RUNOFF FACTOR VALUES

Drainage Area Value	Rainfall/Runoff Value						
	0	1	2	3	4	5	6
1	0	0	0	1	1	1	1
2	0	0	1	1	2	3	4
3	0	0	1	3	7	11	15
4	0	1	2	7	17	25	25

TABLE 4-7
DISTANCE TO SURFACE WATER FACTOR VALUES

Distance	Assigned Value
Less than 100 feet	25
100 feet to 500 feet	20
Greater than 500 feet to 1,000 feet	16
Greater than 1,000 feet to 2,500 feet	9
Greater than 2,500 feet to 1.5 miles	6
Greater than 1.5 miles to 2 miles	3

TABLE 4-8
CONTAINMENT (FLOOD) FACTOR VALUES

Containment Criteria	Assigned Value
Documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by the flood being evaluated	0
Other	10

C-23 F ½

TABLE 4-9
FLOOD FREQUENCY FACTOR VALUES

Floodplain Category	Assigned Value
Source floods annually	50
Source in 10-year floodplain	50
Source in 100-year floodplain	25
Source in 500-year floodplain	7
None of above	0

BLACK & VEATCH Waste Science, Inc.

400 Northridge Road, Suite 350, Atlanta, Georgia 30350, (404) 594-2500, Fax: (404) 587-2930

US EPA -- Region IV
Site Inspection Prioritization
Work Assignment No. 12

BVWS Project 52012.545
September 20, 1995

Mr. Robert Jourdan
Chief, North Superfund Remedial Branch
U.S. Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

REC'D
SEP 21 1995
WPB

Subject: Final Site Inspection Prioritization
Treatment Plant/Oil Services Company
Columbia, Maury County, TN
EPA ID No. TND980515779

Dear Mr. Jourdan:

Enclosed please find three copies of the Final Site Inspection Prioritization for Treatment Plant/Oil Services Company in Columbia, Maury County, Tennessee. If you have any questions, please contact me at 404/643-2320.

Very truly yours,

BLACK & VEATCH Waste Science, Inc.

Felicia Williams-Moon for

Victor Blix
Project Manager

fw
Enclosures

cc: Doug Thompson, EPA PO, w/o enclosures
Deborah Davidson, EPA CO, w/o enclosures
Earl Bozeman, EPA WAM, w/o enclosures

APPENDIX C

SITE INSPECTION WORKSHEETS

This appendix consists of worksheets that can be used to generate an SI site score. Completion of these worksheets is not required, but the SI investigator must evaluate an SI score, either by these worksheets, *PREscore*, or other Regional scoring tools.

The worksheets consist of instructions and data tables to be filled in with scores from HRS reference tables. The data tables may also call for Data Type and References.

DATA TYPE: The Data Type columns should be filled in with an **H**, **Q**, or **+** if the data are HRS quality and well documented. The Data Type column should be filled in with an **E**, **X**, or **-** if the data represent estimates, approximations, or are not fully documented. This type identifies data gaps for the expanded SI to investigate.

REFERENCES: The Reference columns should be filled in with coded reference numbers. The numbered reference list should be attached or the numbering should be cross-referenced to the SI Narrative Report.

The SI investigator will need the current Superfund Chemical Data Matrix (SCDM) OSWER Directive 9345.1-13 (revised semi-annually) to complete these worksheets.

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SITE INSPECTION WORKSHEETS

CERCLIS IDENTIFICATION NUMBER
TND 980515779

SITE LOCATION			
SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE TREATMENT PLANT / OIL SERVICES COMPANY			
STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER 408 SANTA FE PIKE			
CITY COLUMBIA	STATE TN	ZIP CODE 38401	TELEPHONE ( ) —
COORDINATES: LATITUDE and LONGITUDE 35°37'38"N 87°02'15"W	TOWNSHIP, RANGE, AND SECTION Maury County		

OWNER/OPERATOR IDENTIFICATION					
OWNER No Longer in operation			OPERATOR →		
OWNER ADDRESS			OPERATOR ADDRESS		
CITY			CITY		
STATE	ZIP CODE	TELEPHONE ( )	STATE	ZIP CODE	TELEPHONE ( )

SITE EVALUATION		
AGENCY/ORGANIZATION U.S. EPA		
INVESTIGATOR MICHAEL FERRARI		
CONTACT ROBERT MORRIS		
ADDRESS 345 COURTLAND ST. NE		
CITY ATLANTA	STATE GEORGIA	ZIP CODE 30365
TELEPHONE (404) 347-5065		

GENERAL INFORMATION

Site Description and Operational History: Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.

PLEASE SEE SITE INSPECTION PRIORITIZATION

GENERAL INFORMATION (continued)

Site Sketch: Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.

PLEASE SEE SITE INSPECTION PRIORITIZATION

GENERAL INFORMATION (continued)

Source Descriptions: Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

SOURCE TYPES

Landfill: A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

Surface Impoundment: A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

Drum: A portable container designed to hold a standard 55-gallon volume of wastes.

Tank and Non-Drum Container: Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: An area or volume of soil onto which hazardous substances have been spilled, spread, disposed, or deposited.

Pile: Any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of waste piles are:

- Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks.
- Scrap Metal or Junk Pile: A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances.
- Tailings Pile: A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation.
- Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

Land Treatment: Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: Sources not in categories listed above.

GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

PLEASE SEE SITE INSPECTION PRIORITIZATION

Hazardous Waste Quantity (HWQ) Calculation: SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).

① Tanks or non-drum containers

200,000 gallons

200,000 ÷ 500 = 400

Attach additional pages, if necessary Ref. 2

HWQ = 100

SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

		Single Source Sites (assigned HWQ scores)	
(Column 1) TIER	(Column 2) Source Type	(Column 3) HWQ = 10	(Column 4) HWQ = 100
A Hazardous Constituent Quantity	N/A	HWQ = 1 if Hazardous Constituent Quantity data are complete HWQ = 10 if Hazardous Constituent Quantity data are not complete	>100 to 10,000 lbs
B Hazardous Wastestream Quantity	N/A	≤ 500,000 lbs	>500,000 to 50 million lbs
C Volume	Landfill	≤ 6.75 million ft^3 ≤ 250,000 yd^3	>6.75 million to 675 million ft^3 >250,000 to 25 million yd^3
	Surface impoundment	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3
	Drums	≤1,000 drums	>1,000 to 100,000 drums
	Tanks and non-drum containers	≤50,000 gallons	>50,000 to 5 million gallons
	Contaminated soil	≤6.75 million ft^3 ≤250,000 yd^3	>6.75 million to 675 million ft^3 >250,000 to 25 million yd^3
	Pile	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3
	Other	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3
D Area	Landfill	≤340,000 ft^2 ≤7.8 acres	>340,000 to 34 million ft^2 >7.8 to 780 acres
	Surface impoundment	≤1,300 ft^2 ≤0.029 acres	>1,300 to 130,000 ft^2 >0.029 to 2.9 acres
	Contaminated soil	≤3.4 million ft^2 ≤78 acres	> 3.4 million to 340 million ft^2 > 78 to 7,800 acres
	Pile	≤1,300 ft^2 ≤0.029 acres	>1,300 to 130,000 ft^2 >0.029 to 2.9 acres
	Land treatment	≤27,000 ft^2 ≤0.62 acres	>27,000 to 2.7 million ft^2 >0.62 to 62 acres

TABLE 1 (CONTINUED)

Single Source Sites (assigned HWQ scores)		Multiple Source Sites		
(Column 5) HWQ = 10,000	(Column 6) HWQ = 1,000,000	(Column 7) Divisors for Assigning Source WQ Values	(Column 2) Source Type	(Column 1) TIER
>10,000 to 1 million lbs	> 1 million lbs	lbs / 1	N/A	A Hazardous Constituent Quantity
>50 million to 5 billion lbs	> 5 billion lbs	lbs / 5,000	N/A	B Hazardous Wastestream Quantity
>675 million to 67.5 billion ft^3 >25 million to 2.5 billion yd^3	> 67.5 billion ft^3 > 2.5 billion yd^3	ft^3 / 67,500 yd^3 / 2,500	Landfill	C Volume
>675,000 to 67.5 million ft^3 >25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 / 67.5 yd^3 / 2.5	Surface Impoundment	
>100,000 to 10 million drums	> 10 million drums	drums / 10	Drums	
>5 million to 500 million gallons	> 500 million gallons	gallons / 500	Tanks and non-drum containers	
>675 million to 67.5 billion ft^3 >25 million to 2.5 billion yd^3	> 67.5 billion ft^3 > 2.5 billion yd^3	ft^3 / 67,500 yd^3 / 2,500	Contaminated Soil	
>675,000 to 67.5 million ft^3 >25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 / 67.5 yd^3 / 2.5	Pile	
>675,000 to 67.5 million ft^3 >25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 / 67.5 yd^3 / 2.5	Other	
>34 million to 3.4 billion ft^2 >780 to 78,000 acres	> 3.4 billion ft^2 >78,000 acres	ft^2 / 3,400 acres / 0.078	Landfill	D Area
>130,000 to 13 million ft^2 >2.9 to 290 acres	> 13 million ft^2 > 290 acres	ft^2 / 13 acres / 0.00029	Surface Impoundment	
> 340 million to 34 billion ft^2 > 7,800 to 780,000 acres	> 34 billion ft^2 > 780,000 acres	ft^2 / 34,000 acres / 0.78	Contaminated Soil	
> 130,000 to 13 million ft^2 > 2.9 to 290 acres	> 13 million ft^2 > 290 acres	ft^2 / 13 acres / 0.00029	Pile	
>2.7 million to 270 million ft^2 >62 to 6,200 acres	> 270 million ft^2 > 6,200 acres	ft^2 / 270 acres / 0.0062	Land Treatment	

HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available (i.e., incompletely contained) to migrate to that pathway. (Note: If *Actual Contamination Targets* exist for ground water, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3, 4, 5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type.
2. Examine all waste quantity data available for each source. Record constituent quantity and waste stream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source.
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6).

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2):

- The divisor for the area (square feet) of a landfill is 34,000.
- The divisor for the area (square feet) of a pile is 34.
- Wet surface impoundments and tanks and non-drum containers are the only sources for which volume measurements are evaluated for the soil exposure pathway.

SI TABLE 2: HWQ SCORES FOR SITES

Site WQ Total	HWQ Score
0	0
1[a] to 100	1[b]
> 100 to 10,000	100
> 10,000 to 1 million	10,000
> 1 million	1,000,000

[a] If the WQ total is between 0 and 1, round it to 1.
[b] If the hazardous constituent quantity data are not complete, assign the score of 10.

SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Site Name: Treatment Plant / Oil Separator Co.

References 2; 3; 6; 8; 10

Sources:

1. TANKS & NON-DRUM CONTAINERS
2.
3.
4.
5.
6.
7.
8.
9.

SOURCE	HAZARDOUS SUBSTANCE	TOXICITY	GROUND WATER PATHWAY		SURFACE WATER PATHWAY: OVERLAND/FLOOD MIGRATION							SURFACE WATER PATHWAY: GROUND WATER TO SURFACE WATER				AIR
			GW Mobility (HRS Table 3-8)	Tox/ Mobility Value (HRS Table 3-9)	Per (HRS Tables 4-10 and 4-11)	Tox/Per Value (HRS Table 4-12)	Bioac Pot. (HRS Table 4-15)	Tox/ Pers/ Bioac Value (HRS Table 4-16)	Ecotox (HRS Table 4-19)	Ecotox/ Pers (HRS Table 4-20)	Ecotox/ Pers/ Bioacc Value (HRS Table 4-21)	Tox/ Mob/ Pers Value (HRS Table 4-26)	Tox/ Mob/ Pers/ Bioacc Value (HRS Table 4-28)	Ecotox/ Mob/ Pers Value (HRS Table 4-29)	Ecotox/ Mob/ Pers/ Bioacc Value (HRS Table 4-30)	Air Hab/ Toxicity
1	Cadmium	10,000	1	10,000	1	10,000	5,000	5×10^7	1,000	1,000	5×10^6					20
1	Chromium	10,000	1	10,000	1	10,000	5	50,000	10,000	10,000	50,000					2
1	Copper	No toxicity value	1	No Toxicity	1	No Toxicity	50,000	No Toxicity	100	100	5×10^6					No Tox.
1	Lead	10,000	1	10,000	1	10,000	50	500,000	1,000	1,000	5×10^6					2
1	Nickel	10,000	1	10,000	1	10,000	0.5	5,000	10	10	5,000					2
1	Silver	100	1	100	1	100	50	5,000	10,000	10,000	5×10^5					.02
1	Zinc	10	1	10	1	10	500	5,000	10	10	5,000					.002
1	Benzene	100	1	100	0.4	40	5,000	2×10^5	10,000	4,000	2×10^6					100
1	Toluene	10	1	10	0.4	4	50	200	100	40	2,000					10
1	Xylene	1	1	1	0.4	0.4	500	200	100	40	20,000					1
1	Trichloroethylene	10	1	10	0.4	4	5	20	10	4	20					10
1	Tetrachloroethylene	10	1	10	0.4	4	50	200	100	40	2,000					10
1	PCBs	10,000	1	10,000	1	10,000	50,000	5×10^8	10,000	10,000	5×10^8					10,000
Highest	Value	10,000	1	10,000	1	10,000	50,000	5×10^8	10,000	10,000	5×10^8					10,000

Ground Water Observed Release Substances Summary Table

On SI Table 4, list the hazardous substances associated with the site detected in ground water samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

Ground Water Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

Not Applicable

SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

Sample ID	Hazardous Substance	Bckgrd. Conc.	Toxicity/ Mobility	References
	Highest Toxicity/Mobility			

SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
			Highest Percent		Sum of Percents		Sum of Percents	

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
			Highest Percent		Sum of Percents		Sum of Percents	

GROUND WATER PATHWAY
GROUND WATER USE DESCRIPTION

Describe Ground Water Use within 4 Miles of the Site:
Describe generalized stratigraphy, aquifers, municipal and private wells

Please See Site Inspection Printout

Show Calculations of Ground Water Drinking Water Populations for each Aquifer:
Provide apportionment calculations for blended supply systems.
County average number of persons per household: 2.62 Reference 16

0 - 1/4 mile	0
1/4 - 1/2 mile	0
1/2 - 1 mile	0
1 - 2 miles	21
2 - 3 miles	34
3 - 4 miles	73
Total	128 people

Refs. 1, 16, 17

GROUND WATER PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4.	550		
2. POTENTIAL TO RELEASE: Depth to aquifer: 200 feet. ~~If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340~~. Optionally, evaluate potential to release according to HRS Section 3.			
LR =	550		

TARGETS			
Are any wells part of a blended system? Yes____ No X If yes, attach a page to show apportionment calculations.			
3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5). Level I: NONE people x 10 = _____ Level II: NONE people x 1 = _____ Total =	0		
4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1.	6.1		1:16; 17
5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0.	20		3
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0.	0		
7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies. • Irrigation (5 acre minimum) of commercial food crops or commercial forage crops • Watering of commercial livestock • Ingredient in commercial food preparation • Supply for commercial aquaculture • Supply for a major or designated water recreation area, excluding drinking water use	0		1
Sum of Targets T=	26.1		

CONTAINMENT: HRS TABLE 3-2	A	
NET PRECIPITATION: HRS TABLE 3-4	B	
DEPTH TO AQUIFER: HRS TABLE 3-5	C	
* TRAVEL TIME: HRS TABLE 3-7	D	

$A * (B + C + D) = LR$

* IF depth to aquifer is 10 feet or less assign a value of 35.

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

SI Table 6a: Other Than Karst Aquifers

Distance from Site	Pop.	Nearest Well (choose highest)	Population Served by Wells within Distance Category												Pop. Value	Ref.
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000		
0 to $\frac{1}{4}$ mile		20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455		
> $\frac{1}{4}$ to $\frac{1}{2}$ mile		18	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122		
> $\frac{1}{2}$ to 1 mile		9	1	5	17	52	167	523	1,669	5,224	16,684	52,239	166,835	522,385		
> 1 to 2 miles		5	0.7	3	10	30	94	294	939	2,939	9,385	29,384	93,845	293,842		
> 2 to 3 miles		3	0.5	2	7	21	68	212	678	2,122	6,778	21,222	67,777	212,219		
>3 to 4 miles		2	0.3	1	4	13	42	131	417	1,306	4,171	13,060	41,709	130,596		

Nearest Well = [ ]

Sum = [ ]

Karst Aquifers present

Not Applicable

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS (continued)

SI Table 6b: Karst Aquifers

Distance from Site	Pop.	Nearest Well (choose highest)	Population Served by Wells within Distance Category												Pop. Value	Ref.
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000		
0 to $\frac{1}{4}$ mile	0	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	0	1; 1a 17
> $\frac{1}{4}$ to $\frac{1}{2}$ mile	0	20	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122	0	
> $\frac{1}{2}$ to 1 mile	0	20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	0	
> 1 to 2 miles	21	(20)	2	(9)	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	9	
> 2 to 3 miles	34	20	2	9	(26)	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	26	
>3 to 4 miles	73	20	2	9	(26)	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	26	
Nearest Well =		20												Sum =	61	

GROUND WATER PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS	Score	Data Type	Does not Apply
8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water.	100		
9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4.	10,000		
10. Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7)			

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1,000	3
1,000 to < 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	56
1E + 08 or greater	100

WC = 32

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

GROUND WATER PATHWAY SCORE: $\frac{LR \times T \times WC}{82,500}$ = 5.57 (Maximum of 100)

$$\frac{550 \times 26.1 \times 32}{82,500} = 5.568$$

SURFACE WATER PATHWAY

Sketch of the Surface Water Migration Route:
Label all surface water bodies. Include runoff route and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate.

Please See Site Inspection Prioritization

SURFACE WATER PATHWAY

Surface Water Observed Release Substances Summary Table

On SI Table 7, list the hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x Persistence
- TPB = TP x bioaccumulation
- ETPB = EP x bioaccumulation (EP = ecotoxicity x persistence)

Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment samples detecting a hazardous substance at or beyond an intake, evaluate the intake as Level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all are N/A, evaluate the population served by the intake as a Level II target.

Not Applicable
No observed Release
to Surface Water

SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

Sample ID	Hazardous Substance	Bckgrd. Conc.	Toxicity/ Persistence	Toxicity/ Persis./ Bioaccum	Ecotoxicity/ Persis/ Ecobioaccum	References
		Highest Values				

SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RID	% of RID
			Highest Percent		Sum of Percents		Sum of Percents	

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RID	% of RID
			Highest Percent		Sum of Percents		Sum of Percents	

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SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

LIKELIHOOD OF RELEASE– OVERLAND/FLOOD MIGRATION	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.	550		
2. POTENTIAL TO RELEASE: Distance to surface water: 600 (feet) ~~If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency.~~			1; 13; 14; 19
~~Distance to surface water <2500 feet — 500~~ ~~Distance to surface water >2500 feet, and:~~ ~~Site in annual or 10 yr floodplain — 500~~ ~~Site in 100 yr floodplain — 400~~ ~~Site in 500 yr floodplain — 300~~ ~~Site outside 500 yr floodplain — 100~~			
Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2			
LR =	550		

LIKELIHOOD OF RELEASE GROUND WATER TO SURFACE WATER MIGRATION	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions: 1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0. 2) No aquifer discontinuity is established between the source and the above portion of the surface water body. 3) The top of the uppermost aquifer is at or above the bottom of the surface water. Elevation of top of uppermost aquifer _____ Elevation of bottom of surface water body _____			
2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2.			
LR =	0		

– OVERLAND FLOW –

A	CONTAINMENT (OVERLAND): HRS TABLE 4-1			
B (HRS TABLE 4-6)	RUNOFF	DRAINAGE AREA: HRS TABLE 4-3		
		SOIL GROUP: HRS TABLE 4-4		
		RAINFALL/RUNOFF: HRS TABLE 4-5		
C	DIST. TO SURFACE WATER: HRS TABLE 4-7			

D	CONTAINMENT (FLOOD): HRS TABLE 4-8	
E	FLOOD FREQ.: HRS TABLE 4-9	

$$[A * (B + C)] + [D * E] = LR \text{ (maximum of 500)}$$

SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

DRINKING WATER THREAT TARGETS	Score	Data Type	Refs
Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5. Intake Name / Water Body Type / Flow / People Served _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ Are any intakes part of a blended system? Yes _____ No _____ If yes, attach a page to show apportionment calculations.			1; 12;
3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8). _____ , _____ Level I: None people x 10 = _____ Level II: None people x 1 = _____ Total =	0		17; 18; 19
4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1.	0		1; 12
5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0.	0		
6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies. • Irrigation (5 acre minimum) of commercial food crops or commercial forage crops • Watering of commercial livestock • Ingredient in commercial food preparation • Major or designated water recreation area, excluding drinking water use	5		12
SUM OF TARGETS T=	5		

SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

Type of Surface Water Body	Pop.	Nearest Intake	Number of people: 0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	Pop. Value
Minimal Stream (<10 cfs)		20	0	4	17	53	164	522	1,633	5,214	16,325	
Small to moderate stream (10 to 100 cfs)		2	0	0.4	2	5	16	52	163	521	1,633	
Moderate to large stream (> 100 to 1,000 cfs)		0	0	0.04	0.2	0.5	2	5	16	52	163	
Large Stream to river (>1,000 to 10,000 cfs)		0	0	0.004	0.02	0.05	0.2	0.5	2	5	16	
Large River (> 10,000 to 100,000 cfs)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	16	
Very Large River (>100,000 cfs)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	
Shallow ocean zone or Great Lake (depth < 20 feet)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	2	
Moderate ocean zone or Great Lake (Depth 20 to 200 feet)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	
Deep ocean zone or Great Lake (depth > 200 feet)		0	0	0	0	0	0.001	0.003	0.008	0.03	0.08	
3-mile mixing zone in quiet flowing river (≥ 10 cfs)		10	0	2	9	26	82	261	817	2,607	8,163	

Nearest Intake = ______

Sum = ______

References ______________

Not Applicable
-SW intake located ... from site

Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substances detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Fishery ID: _____ Sample Type _____ Level I _____ Level II _____ References _____

Sample ID	Hazardous Substance	Conc. (mg/kg)	Benchmark Concentration (FDAAL)	% of Benchmark	Cancer Risk Concentration.	% of Cancer Risk Concentration	RID	% of RID
			Highest Percent		Sum of Percents		Sum of Percents	

SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

Sample ID	Hazardous Substance	Conc.. (µg/L)	Benchmark Concentration (AWQC or AALAC)	% of Benchmark	References
			Highest Percent		

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

Sample ID	Hazardous Substance	Conc.. (µg/L)	Benchmark Concentration (AWQC or AALAC)	% of Benchmark	References
			Highest Percent		

Not Applicable

SURFACE WATER PATHWAY (continued)
HUMAN FOOD CHAIN THREAT WORKSHEET

HUMAN FOOD CHAIN THREAT TARGETS	Score	Data Type	Refs
Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page.			
Fishery Name [illegible] Water Body [illegible] Flow 2,094 cfs Species____ Production____ lbs/yr Species____ Production____ lbs/yr			19
Fishery Name____ Water Body____ Flow____ cfs Species____ Production____ lbs/yr Species____ Production____ lbs/yr	0		
Fishery Name____ Water Body____ Flow____ cfs Species____ Production____ lbs/yr Species____ Production____ lbs/yr			

FOOD CHAIN INDIVIDUAL

7. ACTUAL CONTAMINATION FISHERIES:

If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery.

20

8. POTENTIAL CONTAMINATION FISHERIES:

If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20.

If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:

Lowest Flow	FCI Value
<10 cfs	20
10 to 100 cfs	2
>100 cfs, coastal tidal waters, oceans, or Great Lakes	0
3-mile mixing zone in quiet flowing river	10

FCI Value = 20

SUM OF TARGETS T = 20

SURFACE WATER PATHWAY (continued)
ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

ENVIRONMENTAL THREAT TARGETS	Score	Data Type	Refs
Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page.			18; 19

Environment Name	Water Body Type	Flow
Wetlands	Large River	2,094 cfs
		cfs
		cfs
		cfs
		cfs

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

Environment Name	Environment Type and Value (SI Tables 13 & 14)	Multiplier (10 for Level I, 1 for Level II)	Product
		x =	
		x =	
		x =	
		x =	
		Sum =	0

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

Flow	Dilution Weight (SI Table 12)	Environment Type and Value (SI Tables 13 & 14)	Pot. Cont.	Product
cfs	0.001 x	Wetland 3,000 x	0.1 =	0.01
cfs	0.001 x	Wetland 7.5 x	0.1 =	0.0075
cfs	x	x	0.1 =	
cfs	x	x	0.1 =	
cfs	x	x	0.1 =	
		Sum =		0.0175
		T =		0.0175

SI TABLE 12 (HRS Table 4-13): SURFACE WATER DILUTION WEIGHTS

Type of Surface Water Body		Assigned Dilution Weight
Descriptor	Flow Characteristics	
Minimal stream	< 10 cfs	1
Small to moderate stream	10 to 100 cfs	0.1
Moderate to large stream	> 100 to 1,000 cfs	0.01
Large stream to river	> 1,000 to 10,000 cfs	0.001
Large river	> 10,000 to 100,000 cfs	0.0001
Very large river	> 100,000 cfs	0.00001
Coastal tidal waters	Flow not applicable; depth not applicable	0.0001
Shallow ocean zone or Great Lake	Flow not applicable; depth less than 20 feet	0.0001
Moderate depth ocean zone or Great Lake	Flow not applicable; depth 20 to 200 feet	0.00001
Deep ocean zone or Great Lake	Flow not applicable; depth greater than 200 feet	0.000005
3-mile mixing zone in quiet flowing river	10 cfs or greater	0.5

SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Critical habitat for Federal designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Ecologically important areas identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes) National Monument (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
Habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Coastal Barrier (undeveloped) Federal land designated for the protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding National river reach designated as recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for the protection of maintenance of aquatic life under the Clean Water Act	5
Wetlands — See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway)	105

SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

Total Length of Wetlands	Assigned Value
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 16 to 20 miles	450
Greater than 20 miles	500

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SURFACE WATER PATHWAY (concluded)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS	Score
14. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater.	100

15. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat.

	Substance Value		HWQ		Product	WC Score (from Table) (Maximum of 1000)
Drinking Water Threat Toxicity/Persistence	10,000	x	100	=	1×10^6	32
Food Chain Threat Toxicity/Persistence Bioaccumulation	5×10^8	x	100	=	5×10^{10}	320
Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation	5×10^8	x	100	=	5×10^{10}	320

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1,000	3
1,000 to < 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
DW → 1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	56
1E + 08 to <1E + 09	100
1E + 09 to <1E + 10	180
FC, ET → 1E + 10 to <1E + 11	320
1E + 11 to <1E + 12	560
1E + 12 or greater	1000

SURFACE WATER PATHWAY THREAT SCORES

Threat	Likelihood of Release (LR) Score	Targets (T) Score	Pathway Waste Characteristics (WC) Score (determined above)	Threat Score $\frac{LR \times T \times WC}{82,500}$
Drinking Water	550	5	32	(maximum of 100) 1.067
Human Food Chain	550	20	320	(maximum of 100) 42.67
Environmental	550	0.0175	320	(maximum of 60) 0.037

SURFACE WATER PATHWAY SCORE (Drinking Water Threat + Human Food Chain Threat + Environmental Threat)	(maximum of 100) 43.77

SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no known surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

Soil Exposure Resident Population Targets Summary

For each property (duplicate page 35 as necessary):

If there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substances listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both percentages are less than 100% or all are N/A, evaluate the targets as Level II.

SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: ______________ Level I ______ Level II ______ Population ______________

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

Residence ID: ______________ Level I ______ Level II ______ Population ______________

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

Residence ID: ______________ Level I ______ Level II ______ Population ______________

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

Not Applicable
- No schools present within 200' of site Ref. 1

SOIL EXPOSURE PATHWAY WORKSHEET
RESIDENT POPULATION THREAT

LIKELIHOOD OF EXPOSURE	Score	Data Type	Refs
1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0.	550		2, 3, 6
LE =	550		

TARGETS

2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3). Level I: _____ people x 10 = _____ Level II: _____ people x 1 = _____ Sum =	0		
3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (*i.e.*, no Level I or Level II targets), assign 0 (HRS Section 5.1.3).	0		
4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site.	0		
5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination. Sum =	0		
6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies. • Commercial agriculture • Commercial silviculture • Commercial livestock production or commercial livestock grazing	0		
Total of Targets T=	0		

Number of Workers	Score
0	0
1 to 100	5
101 to 1,000	10
>1,000	15

Terrestrial Sensitive Environment Type	Value

SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

TERRESTRIAL SENSITIVE ENVIRONMENT	*ASSIGNED VALUE*
Terrestrial critical habitat for Federal designated endangered or threatened species National Park Designated Federal Wilderness Area National Monument	100
Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species National Preserve (terrestrial) National or State terrestrial Wildlife Refuge Federal land designated for protection of natural ecosystems Administratively proposed Federal Wilderness Area Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	75
Terrestrial habitat used by State designated endangered or threatened species Terrestrial habitat used by species under review for Federal designated endangered or threatened status	50
State lands designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25

- Not Applicable

No terrestrial sensitive environment within 2000' of site.

Ref: 1, 20

SOIL EXPOSURE PATHWAY WORKSHEET
NEARBY POPULATION THREAT

LIKELIHOOD OF EXPOSURE		Score	Data Type	Ref.
7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6)	Value 10			
Area of Contamination (from SI Table 18 or HRS Table 5-7)	Value 40			3
Likelihood of Exposure (from SI Table 19 or HRS Table 5-8)				
	LE =	5		

TARGETS	Score	Data Type	Ref.
8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated.	1		1; 16; 21; 22
9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (*i.e.*, properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1.	1.8		↓
T =	2.8		

SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS/ACCESSIBILITY VALUES

Area of Observed Contamination	Assigned Value
Designated recreational area	100
Regularly used for public recreation (for example, vacant lots in urban area)	75
Accessible and unique recreational area (for example, vacant lots in urban area)	75
Moderately accessible (may have some access improvements–for example, gravel road) with some public recreation use	50
Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use	25
Accessible with no public recreation use	10
Surrounded by maintained fence or combination of maintained fence and natural barriers	5
Physically inaccessible to public, with no evidence of public recreation use	0

SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

Total area of the areas of observed contamination (square feet)	Assigned Value
≤ to 5,000	5
> 5,000 to 125,000	20
> 125,000 to 250,000	40
> 250,000 to 375,000	60
> 375,000 to 500,000	80
> 500,000	100

SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

Ref. 1

AREA OF CONTAMINATION FACTOR VALUE	ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE						
	100	75	50	25	(10)	5	0
100	500	500	375	250	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
(40)	250	125	50	25	(5)	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

Travel Distance Category (miles)	Pop.	Number of people within the travel distance category												Pop. Value
		0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,001	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	
Greater than 0 to $\frac{1}{4}$	76	0	0.1	0.4	(1.0)	4	13	41	130	408	1,303	4,081	13,034	1
Greater than $\frac{1}{4}$ to $\frac{1}{2}$	506	0	0.05	0.2	0.7	2	(7)	20	65	204	652	2,041	6,517	7
Greater than $\frac{1}{2}$ to 1	2,116	0	0.02	0.1	0.3	1	3	(10)	33	102	326	1,020	3,258	10
													Sum =	18

Reference(s) 1, 16, 21, 22

SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS

10.	Assign the hazardous waste quantity score calculated for soil exposure	100
11.	Assign the highest toxicity value from SI Table 16	10,000
12.	Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:	WC = 32

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1,000	3
1,000 to < 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	56
1E + 08 or greater	100

RESIDENT POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 1;
Targets = Sum of Questions 2, 3, 4, 5, 6)

$$\frac{LE \times T \times WC}{82,500}$$

0

NEARBY POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 7;
Targets = Sum of Questions 8, 9)

$$\frac{LE \times T \times WC}{82,500}$$

0.01

SOIL EXPOSURE PATHWAY SCORE:
Resident Population Threat + Nearby Population Threat

0.01
(Maximum of 100)

NPTS $\frac{550 \times 0 \times 32}{82,500}$

NPTS $\frac{5 \times 2.8 \times 32}{82,500} = .00543$

Air Pathway Observed Substances Summary Table

On SI Table 21, list the hazardous substances detected in air samples of a release from the site. Include only those substances with concentrations significantly greater than background levels. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For NAAQS/NESHAPS benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate targets in the distance category from which the sample was taken and any closer distance categories as Level I. If the percentages are less than 100% or all are N/A, evaluate targets in that distance category and any closer distance categories that are not Level I as Level II.

SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

Hazardous Substance	Conc. (µg/m^3)	Gaseous Particulate	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RID	% of RID
	Highest Toxicity/ Mobility		Highest Percent		Sum of Percents		Sum of Percents	

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

Hazardous Substance	Conc. (µg/m^3)	Toxicity/ Mobility	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RID	% of RID
	Highest Toxicity/ Mobility		Highest Percent		Sum of Percents		Sum of Percents	

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

Hazardous Substance	Conc. (µg/m^3)	Toxicity/ Mobility	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RID	% of RID
	Highest Toxicity/ Mobility		Highest Percent		Sum of Percents		Sum of Percents	

AIR PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21.	0		
2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2).	500		
LR =	500		

TARGETS

3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air. a) Level I: _____ people x 10 = _____ b) Level II: _____ people x 1 = _____ Total =	0		
4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply the sum by 0.1.	10.67		1; 21
5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22.	20		
6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air.	0		
7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release.	1.897		20; 23
8. RESOURCES: Assign a score of 5 if one or more air resources apply within 1/2 mile of a source; assign a 0 if none applies. • Commercial agriculture • Commercial silviculture • Major or designated recreation area	0		
T =	32.57		

Sensitive Environment Type	*Value*
_____	_____
_____	_____
_____	_____
Wetland Acreage	*Value*
_____	_____
_____	_____
_____	_____

SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

Distance from Site	Pop.	Nearest Individual (choose highest)	Number of People within the Distance Category												Pop. Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000	
On a source	0	(20)	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	0
0 to $\frac{1}{4}$ mile	76	*	1	4	(13)	41	131	408	1,304	4,081	13,034	40,812	130,340	408,114	13
$>\frac{1}{4}$ to $\frac{1}{2}$ mile	506	2	0.2	0.9	3	9	(28)	88	282	882	2,815	8,815	28,153	88,153	23
$>\frac{1}{2}$ to 1 mile	2,916	1	0.06	0.3	0.9	3	8	(26)	83	261	834	2,612	8,342	26,119	23
> 1 to 2 miles	4,727	0	0.02	0.09	0.3	0.8	3	8	(27)	83	266	833	2,659	8,326	9
> 2 to 3 miles	3,347	0	0.009	0.04	0.1	0.4	1	4	(12)	38	120	375	1,199	3,755	12
>3 to 4 miles	964	0	0.005	0.02	0.07	0.2	(0.7)	2	7	23	73	229	730	2,285	2
	Nearest Individual =	20												Sum =	106.7

References 1, 2

* Score = 20 if the Nearest Individual is within $\frac{1}{8}$ mile of a source; score = 7 if the Nearest Individual is between $\frac{1}{8}$ and $\frac{1}{4}$ mile of a source.

SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

Wetland Area	Assigned Value
< 1 acre	0
1 to 50 acres	25
> 50 to 100 acres	75
> 100 to 150 acres	125
> 150 to 200 acres	175
> 200 to 300 acres	250
> 300 to 400 acres	350
> 400 to 500 acres	450
> 500 acres	500

0 - 1/4 0

1/4 - 1/2 0

1/2 - 1 0

1 - 2 11

2 - 3 23

3 - 4 39

SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from SI Tables 13 and 20)	Product
On a Source	0.10	x	
		x	0
0 to 1/4 mile	0.025	x 75 Habitat T&E	1.875
		x	
		x	
1/4 to 1/2 mile	0.0054	x	
		x	
		x	0
1/2 to 1 mile	0.0016	x	
		x	
		x	0
1 to 2 miles	0.0005	x 25 wetlands	0.0125
		x	
		x	
2 to 3 miles	0.00023	x 25 Wetlands	0.00575
		x	
		x	
3 to 4 miles	0.00014	x 25 Wetlands	0.0035
		x	
		x	
> 4 miles	0	x	
		Total Environments Score =	1.891

WASTE CHARACTERISTICS

9. If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration.	100
10. Assign the highest air toxicity/mobility value from SI Table 3 .	10,000
11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:	WC = 32

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1,000	3
1,000 to < 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	56
1E + 08 or greater	100

AIR PATHWAY SCORE: $\frac{LE \times T \times WC}{82,500}$ = 6.32 (maximum of 100)

$\frac{500 \cdot 32.57 \times 32}{82,500} = 6.3166$

SITE SCORE CALCULATION	S	S^2
GROUND WATER PATHWAY SCORE (S_{GW})	5.57	31.0249
SURFACE WATER PATHWAY SCORE (S_{SW})	43.77	1,915.3129
SOIL EXPOSURE (S_S)	0.01	0.001
AIR PATHWAY SCORE (S_A)	6.32	39.9424
SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ = $\sqrt{\frac{1982.7812}{4}}$ = $\sqrt{496.6953}$ = 22.2867		22.27

COMMENTS

REFERENCE NO. 1

OVERSIZED

DOCUMENT

REFERENCE NO. 2

60-51

New 1-14

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	D980515779

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Oil Service Co./Treatment Plant	408 Santa Fe Pike

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Columbia	TN	38401	Maury	119	06

09 COORDINATES LATITUDE	LONGITUDE
35 37 38.-	087 02 15.-

10 DIRECTIONS TO SITE (Starting from nearest public road)

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
President - Kenneth Harris Oil Services Co.	Box 1203

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Columbia	TN	38401	(615)381-4999

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)

☑ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☐ YES DATE ___/___/___ (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)	03 YEARS OF OPERATION		
☐ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN	1930 (BEGINNING YEAR)	— (ENDING YEAR)	☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Water soluble oils

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☑ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
		( )

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Kenneth R. Davis	SWM	TN. Dept of H. & E.	(615)741-3657	12 / 12 / 87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	D980515779

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☑ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS _____
- NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply) None

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
X OLW	OILY WASTE	2.0×10^5	Gallons	Treat 1.0×10^5 Gallons/Day
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
7					

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling results)

County files (60-37) at TN. Dept. of Health and Environment, Nashville Central Office (Division of Solid Waste Management)

EPA's Process Code Report

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	D980515779

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: _____ (Acres)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	D980515779

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

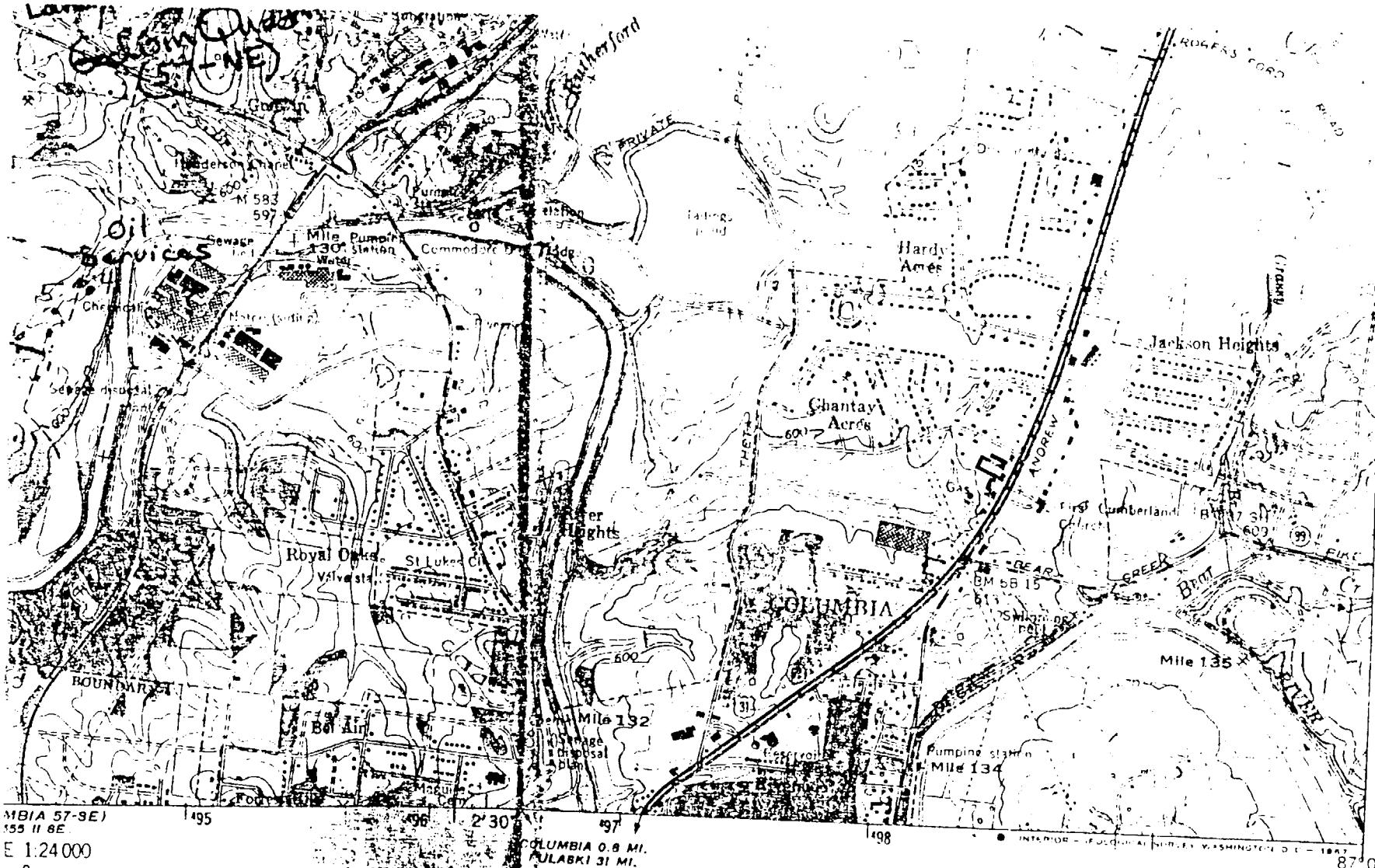
05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)

FORM 2070-12 (7-81)



MBIA 57-SE)
555 II 8E

E 1:24000

0
3000 4000 5000 6000 7000 FEET
0 1 KILOMETER

NTERVAL 20 FEET
NT HALF-INTERVAL CONTOURS
EAN SEA LEVEL

TIONAL MAP ACCURACY STANDARDS

SURVEY, WASHINGTON, D.C. 20242,
OLOGY, NASHVILLE, TENN. 37219,
OOGA, TENN. 37401 OR KNOXVILLE, TENN. 37902
APS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty	Poor motor road
Medium-duty	Wagon and jeep track
Light-duty	Foot trail
U. S. Route	State Route

In developed areas, only through roads are classified

GODWIN, TENN.
N3537.5—W8700/7.5

1965

AMS 3655 II NE-SERIES V841

REFERENCE NO. 3

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515779

II. SITE NAME AND LOCATION

01 SITE NAME	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
OJ Service Co. / Treatment Plant	408 Santa Fe Pike

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Columbia	TN	38401	Maury		

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
		X A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
4-5-84 (MONTH DAY YEAR)	X ACTIVE ☐ INACTIVE	1980 (BEGINNING YEAR) / present (ENDING YEAR) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
X E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Karen Bonner	Chemist	Sverdrup	(615) 741-6287
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Charles Allen	Engineer	Sverdrup	615 741-6287
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
Kenneth Harris	President	202 Hill St. Columbia, TN 38401	(615) 381-4999
Steve Maloney	Operator	Tri-Tech Rd. Waldron Traverse, Tn.	1615 388-3488
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
X PERMISSION ☐ WARRANT	12:30 PM	Cloudy, 45°F

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Steve Maloney	Tri-Tech Laboratories	1615 793-7547

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Karen Bonner	Sverdrup		615-741-6287	4-9-84 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TN0980515??

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A. SOLID
- B. POWDER, FINES
- C. SLUDGE
- D. OTHER _____ (Specify)
- E. SLURRY
- X F. LIQUID
- G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS: _____
- CUBIC YARDS: _____
- NO. OF DRUMS: _____

03 WASTE CHARACTERISTICS (Check all that apply)

- A. TOXIC
- B. CORROSIVE
- C. RADIOACTIVE
- D. PERSISTENT
- E. SOLUBLE
- F. INFECTIOUS
- G. FLAMMABLE
- H. IGNITABLE
- I. HIGHLY VOLATILE
- J. EXPLOSIVE
- K. REACTIVE
- L. INCOMPATIBLE
- M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	Unknown		
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently used CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4-5-84 Site Investigation

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515779

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE	04 TREATMENT (Check all that apply)	05 OTHER
☐ A. SURFACE IMPOUNDMENT			☐ A. INCENERATION	☒ A. BUILDINGS ON SITE
☐ B. PILES			☐ B. UNDERGROUND INJECTION	
☐ C. DRUMS, ABOVE GROUND			☐ C. CHEMICAL/PHYSICAL	
☐ D. TANK, ABOVE GROUND			☐ D. BIOLOGICAL	
☐ E. TANK, BELOW GROUND			☒ E. WASTE OIL PROCESSING	06 AREA OF SITE
☐ F. LANDFILL			☐ F. SOLVENT RECOVERY	
☐ G. LANDFARM			☐ G. OTHER RECYCLING/RECOVERY	_____ (Acres)
☐ H. OPEN DUMP			☐ H. OTHER (Specify) _____	
☒ I. OTHER (Specify) Basins	unknown			

07 COMMENTS

This is an old sewer treatment plant that Oil Services leased 3 years ago. A company by the name of Tri-Tech operates this plant for them. They treat waste oil. Waste water is discharged to the municipal system and is tested very so often. Oil Services hauls sludge and waste oil out to a licensed treatment facility.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☒ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Waste oil is contained in concrete basins.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

4-5-84 - Site Investigation

EPA FORM 2070-13 (7-81)

(5)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TN0980515MS

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. 10^{-4} – 10^{-6} cm/sec ☐ B. 10^{-4} – 10^{-6} cm/sec ☐ C. 10^{-4} – 10^{-6} cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec.) ☐ B. RELATIVELY IMPERMEABLE (10^{-4} – 10^{-6} cm/sec) ☐ C. RELATIVELY PERMEABLE (10^{-2} – 10^{-4} cm/sec.) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec.)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
_____ (ft)	_____ (ft)	_____	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE		
		SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
_____ (in)	_____ (in)	_____ %		_____ %

09 FLOOD POTENTIAL	10
SITE IS IN _____ YEAR FLOODPLAIN	☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)		12 DISTANCE TO CRITICAL HABITAT (of endangered species)
ESTUARINE	OTHER	_____ (mi)
A. _____ (mi)	B. _____ (mi)	ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS	
		PRIME AG LAND	AG LAND
A. _____ (mi)	B. _____ (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515774

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)			02 STATUS			03 DISTANCE TO SITE
	SURFACE	WELL	ENDANGERED	AFFECTED	MONITORED	
COMMUNITY	A. ☐	B. ☐	A. ☐	B. ☐	C. ☐	A. _____ (mi)
NON-COMMUNITY	C. ☐	D. ☐	D. ☐	E. ☐	F. ☐	B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

COMMERCIAL, INDUSTRIAL, IRRIGATION (Adequate other sources available)

02 POPULATION SERVED BY GROUND WATER _____

03 DISTANCE TO NEAREST DRINKING WATER WELL _____ (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
_____ (ft)	_____	_____ (ft)	_____ (gpd)	☐ YES ☐ NO

09 DESCRIPTION OF WELLS (Including acreage, depth, and location relative to population and buildings)

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☐ NO	COMMENTS:	☐ YES ☐ NO	COMMENTS:

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION, DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED:	DISTANCE TO SITE
		_____ (mi)
		_____ (mi)
		_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN:

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. _____ NO. OF PERSONS	B. _____ NO. OF PERSONS	C. _____ NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: _____ (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE	04 DISTANCE TO NEAREST OFF-SITE BUILDING
_____	_____ (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TND 980558772

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ☐ AERIAL

02 IN CUSTODY OF _____
(Name of organization or individual)

03 MAPS ☐ YES ☐ NO

04 LOCATION OF MAPS _____

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515779

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
City of Columbia				Columbia	TN	38401

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4-5-84 - Site Investigation

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION
01 STATE: TN | 02 SITE NUMBER: TND980558

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
TRI-TECH		WALDRON RD		LAVERGNE	TN	

08 YEARS OF OPERATION	09 NAME OF OWNER

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4-5-84 - Site Investigation

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TND980515119

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE: TN | 02 SITE NUMBER: TND980515[illegible]

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515279

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TN0980515779

II. ENFORCEMENT INFORMATION

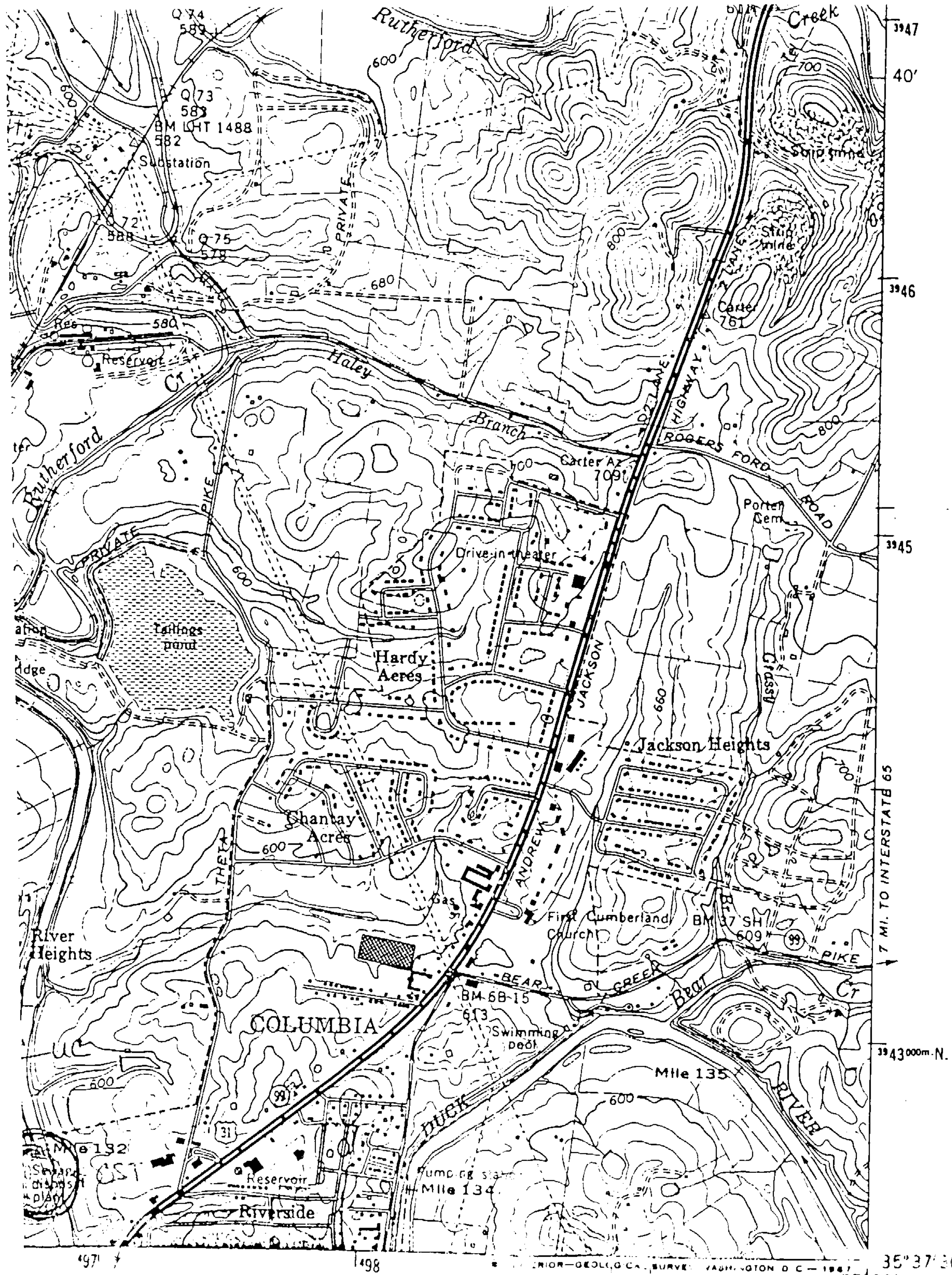
01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4-5-84 - Site Investigation

EPA FORM 2070-13 (7-81)



7 MI. TO INTERSTATE 65
Rutherford
Creek
Haley
Branch
Rutherford
Cr
Grassy
Bear
Cr
DUCK
RIVER
JACKSON
HIGHWAY
ROGERS FORD ROAD
ANDREW
BEAR CREEK PIKE
THETA PIKE
PRIVATE
Carter 761
Carter Az 709
Porter Cem
Drive-in theater
Hardy Acres
Jackson Heights
Shantay Acres
First Cumberland Church
BM 37 SH 609
BM 6B-15 613
Swimming pool
Gas
COLUMBIA
River Heights
Riverside
Reservoir
Tailings pond
Substation
BM LHT 1488 582
Q 73 583
Q 74 589
Q 72 588
Q 75 578
Mile 135
Mile 134
Mile 132
Pumping station
3947
3946
3945
3943000m. N.
40′
497
498
35°37′30″
87°00′

REFERENCE NO. 4

BLACK & VEATCH Waste Science, Inc.
Philadelphia Office

MEMORANDUM

USEPA Region IV
Treatment Plant/Oil Services Co.
Waste Treatment

BVWS Project 52012.545
BVWS File N
February 10, 1995
0923

To: Treatment Plant/Oil Services Co. File

From: Michael Ferrari

On this date I spoke with Roger LeMaster (RL) at the Tennessee Department of Health and Environment, Wastewater Treatment Division [(615) 532-0625]. The information which I obtained from RL differed from the information I received previously from Carol Shell, president of Tri-Tech Laboratories [(615) 793-7547].

According to RL, Oil Services Company (OSCO) did operate at the former Columbia Wastewater Treatment Plant, but after they moved from Columbia to Nashville, they did not go out of business. They still operate out of their Nashville office.

RL said that OSCO used to receive waste oil and grease from a number of different sources; primarily from electroplating and degreasing operations. The waste was treated to remove metals and organics. Non-hazardous sludge was disposed of in a licensed landfill, and hazardous sludge waste was taken to a permitted hazardous waste landfill. OSCO performed their own periodic testing on their wastestreams. OSCO had a NPDES permit which allowed them to discharge treated wastewater into the municipal water system.

REFERENCE NO. 5

60-528

August 8, 1983

Superfund
634 Site Master List-Public Comment
Rebecca F. Harris

Telephone call from:
Ken Harris - Oil Services Co.
Columbia, Tennessee

maury Co.

Three sites on Master List involve Harris' operations:

1. Treatment Plant/Oil Services Co. 408 Santa Fe Pike
   Columbia, Tennessee

This facility, an out of service municipal wastewater treatment plant, is now operated as a private wastewater treatment plant for soluble oil treatment. Sludge and skimmed oils go to a refinery for oil recovery. Clean-up residues from cleaning of tanks after sludge removal go to the Chemical Waste Management Alabama Landfill for disposal.

The Santa Fe Pike facility is owned by the City of Columbia. Harris leased it for the last (3) three years accepting only non-hazardous water soluble oil waste streams. Tri-tech Corp., run by Gerry Shell, wants to pick up the lease and operate the plant although Harris would still provide the waste streams.

2. Kenneth Harris Oil
   Carter's Creek Pike
   Columbia, Tennessee

This listing references a pond which was excavated behind Harris' residence off Carter's Creek Pike. The pond was used as a temporary treatment facility for waste oil streams that were scheduled to go to the Santa Fe Pike Facility. Harris apparently contracted to haul the waste to the Santa Fe Facility then ran into negotiations problems with the city. The pond was used on a one time basis for an unspecified period of time while Harris completed negotiations for the Santa Fe Facility. Harris dug the pond, treated the oily wastewater, and transported the treated water to the city WWTP. The sludge and skimmed oil were sent to a refinery for oil recovery. The pond was then filled in. Harris stated that these activities were conducted under an agreement with Water Quality Control. A letter was written that should be in Water Management Files.

3. Oil Service Co.
   202 Hill Street
   Columbia, Tennessee

This is the site of Harris' current operations. He has submitted a Part B application to James Spicer of the SWM Nashville Field Office. No hazardous waste disposal has been or will be conducted there.

REFERENCE NO. 6

NAJ
Dum 6-1
JTT 6-6
JKS 6-13
TDH 6-29
JW 7-6
SMH 7-13
1

May 22, 1979

CERTIFIED MAIL

Mr. Michael Stone
Director, Sewer Services
City of Columbia
707 North Main Street
Columbia, Tennessee 38401

Re: Oil Service Company
Disposition of Waste Oil
Columbia, Maury County, Tennessee

Dear Mr. Stone:

This letter will confirm our telephone conversation of May 16, 1979, in which you agreed to inform Mr. Kenneth Harris, owner of Oil Service Company, that he could no longer dump any waste oils or other waste materials into the municipal sewer system in Columbia. As you know, this office has received several complaints stemming from the fact that Mr. Harris has allegedly been allowed to introduce waste materials, including water-soluble oils, in an untreated form into the old Columbia Sewage Treatment Plant, in violation of that City's sewer use ordinance. Although we have only been aware of Oil Service Company's agreement with the City of Columbia for the past few weeks, it is now obvious that past operational problems investigated by personnel from this Division, such as a "milky" substance entering and discharging from the old treatment plant, were due to water-soluble oils and other waste materials from Oil Service Company.

Furthermore, you stated in our conversation that, if Mr. Harris is successful in his efforts to lease the old sewage treatment plant for pretreatment of his waste materials, a rigid monitoring program will be set up by the City of Columbia to assure compliance with pretreatment standards before any of these treated waste materials are allowed to enter the new municipal sewer system. The new sewage treatment plant has just gone on line, of course, and every effort must be made to protect it from the operational difficulties experienced by the old plant due to the introduction of oily waste materials.

We certainly appreciate your cooperation and prompt attention to this matter. If you have any questions or comments concerning this correspondence, please contact this office at your convenience. (Telephone No. 741-7391)

REFERENCE NO. 7

BLACK & VEATCH Waste Science, Inc.
Philadelphia Office

MEMORANDUM

USEPA Region IV
Treatment Plant/Oil Services Co.
Facility Status

BVWS Project 52012.545
BVWS File N
February 9, 1995
1525

To: Treatment Plant/Oil Services Co. File

From: Michael Ferrari

On this date I spoke with Carol Shell, president of Tri-Tech Laboratories [(615) 793-7547], to try to obtain any current information regarding the current status of the Treatment Plant facility (the most recent information available in the project files was dated 1984).

According to Ms. Shell, the Treatment Plant facility was owned by a partnership between Tri-Tech Labs and Oil Services Company, and the property was sold sometime in the 1980's. Since that time, Oil Services Company moved their office to Nashville, TN, and then went out of business (quite a few years ago). To the best of her knowledge, the facility is no longer in operation.

REFERENCE NO. 8

SOURCE

Oil Service Company will accept for treatment wastes primarily from three types of sources. It is anticipated that the total flow will amount to approximately 50,000 gallons per week. Approximately 60% of the flow will be cooling water from an aluminum rolling mill, 30% will be cooling water from a screw truning and cutting operation, and 10% will be cooling water from a metal molding and plating operation.

An analysis was performed on a composite sample of the wastewater. The results are as follows:

COD, mg/l O_2	91,800
TSS mg/l	7,920
TDS mg/l	6,000
pH, units	7.4
T.Alk., mg/l as $CaCO_3$	2,100
T.Hard., mg/l as $CaCO_3$	180
Oil & Grease, mg/l	50,500

* A definition of abbreviations is in the appendix.

TREATABILITY OF THE WASTEWATER

The composite sample was tested in the lab to determine treatability using physical/chemical methods. When the composite sample was allowed to stand quiescent for three days, it separated into three zones as shown in Figure A. The middle zone contained 8,700 mg/l oil and grease. Based on this analysis, it is concluded that an oil removal efficiency of greater than 82 percent can be achieved by sedimentation alone.

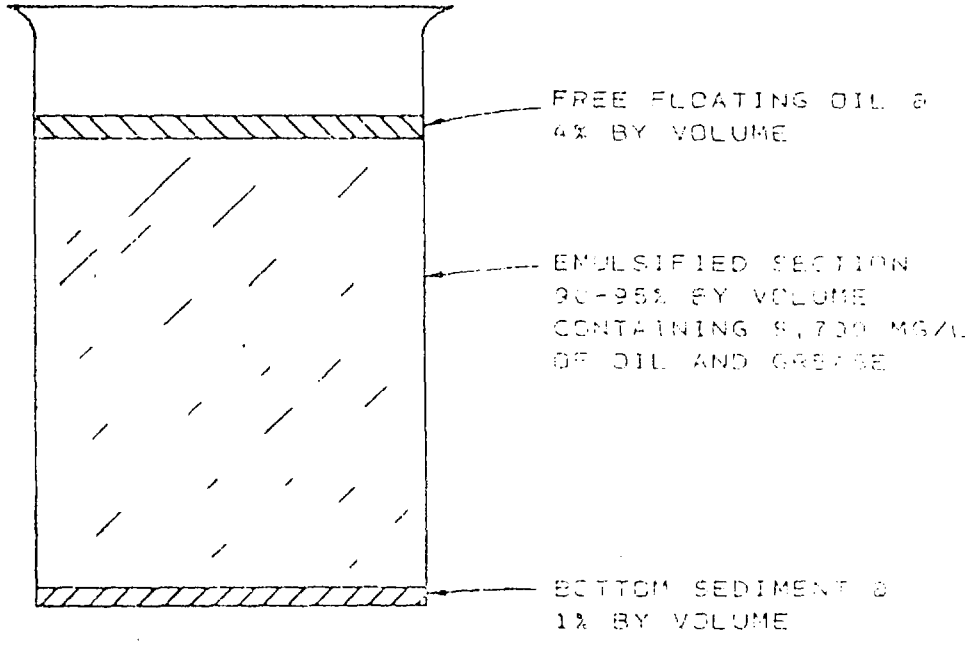
Various treatment process and chemicals were investigated to treat the middle zone for further reduction of oil and grease concentration. It was found that the optimum chemical for removal by sedimentation is dry alum added at the rate of 4,000 mg/l. Floc particle size progresses from very fine (0.1 mm) to large (5 mm) particles within five minutes. The settling rate is 0.14 ft./hr. After 30 minutes of settling, the oil and grease content of the supernatant is 210 mg/l. After two hours of settling, the oil and grease content of the supernatant is approximately 100 mg/l. Polymer addition decreased settling time but did not increase the removal efficiency.

An analysis was performed on the supernatant from the settled sample. The results are as follows:

TSS,	mg/l	2.	99% Removal
Oil & Grease,	mg/l	125	99.8% Removal

As a final treatment step, the supernatant was subjected to an air stripping process. The process reduced the oil and grease concentration to 73 mg/l after 30 minutes.

FIGURE A


FREE FLOATING OIL @
4% BY VOLUME
EMULSIFIED SECTION
90-95% BY VOLUME
CONTAINING 5,700 MG/L
OF OIL AND GREASE
BOTTOM SEDIMENT @
1% BY VOLUME

A sample of the oil, following treatment by primary settling, coagulation with alum, and final settling, was analyzed for heavy metals content. The metals considered were cadmium, chrome, lead, and zinc. The results of the analyses are presented in Table 1 and compared to limiting concentrations established by regulatory agencies for discharge to municipal collection and treatment systems. The concentration of heavy metals in the Oil Service wastewater effluent seems to be well below the generally accepted maximums for discharge to the municipal sewer system.

TABLE 1

HEAVY METALS CONTENT OF TREATED OIL WASTE COMPARED TO ACCEPTABLE LIMITS FOR DISCHARGE TO MUNICIPAL TREATMENT SYSTEMS

	Concentration in mg/l			
Metal Constituent	Oil Service Co. Treated Effluent	Tenn. Dept. of Public Health Guidelines[1]	EPA Guidelines for Activated Sludge[2]	Pretreatment Regulations for Electroplaters[3]
Cadmium, Cd	0.02	1.0	10 - 100	.5
Total Chromium, Cr	0.2	0.5	50	---[4]
Lead, Pb	<0.2	1.0	0.1	.4
Zinc, Zn	0.9	2.0	.08 - 10	1.5[5]

[1] Tennessee Department of Public Health, "Maximum Effluent Standards for Discharge of Waste into the Municipal Sewerage System."
[2] "Federal Guidelines, State and Local Pretreatment Programs, Volume 1," EPA-430/9-76-017a, January, 1977.
[3] "Electroplating Point Source Category - Proposed Pretreatment Standards for Existing Sources," EPA Proposed Regulations, Federal Register, Tuesday, February 14, 1978, for plants discharging less than 10,000 gallons per day.
[4] No standard given for total chromium.
[5] For plants discharging more than 10,000 gallons per day.

PROPOSED TREATMENT

The waste oil will be treated in the old Columbia wastewater treatment plant utilizing existing facilities to the maximum extent possible. Waste oil will be trucked to the plant where it will be discharged to the grit chamber. From the grit chamber it will be routed to one of the two primary clarifiers for an initial settling period of several days.

The float and bottoms from the initial settling period will be removed and pumped to storage vessels to await transport to an oil reclaimer. The middlings will be held in the clarifier for further treatment by coagulation with alum. The middlings will be pumped to a mixing tank where alum will be added and sufficient mixing provided to initiate flocculation.

The mixture will be transferred to the second primary clarifier for settling. The settled sludge and any float solids will be removed and pumped to storage vessels for transport to the reclaimer. The settled wastewater will be discharged from the primary clarifier to one of the trickling filters for aeration to provide further removal of oil. Trickling filter effluent will be routed to the final clarifier.

The treated wastewater will be held in the final clarifier for purposes of sampling by city officials and oil service company. The city will be notified at this time and will be provided an opportunity to sample the wastewater. Analyses of a split sample will be conducted for oil and grease and suspended solids. If the results of this analysis indicate that the waste meets the city's pretreatment requirements, the clarifier

will be drained into the municipal collection system. If initial tests indicate that the wastewater does not meet pretreatment limits for these constituents, then further treatment will be provided until the wastewater is within the desired limits. The wastewater will not be discharged to the municipal collection system until the particular batch of wastewater is inspected and approved by representatives of the City and its discharge is authorized by the City.

DEFINITIONS

COD	Chemical Oxygen Demand
TSS	Total Suspended Solids
TDS	Total Dissolved Solids
T. Alk.	Total Alkilinity
T. Hard	Total Hardness
mg/l	Milligrams per Liter
mm	Millimeter

REFERENCE NO. 9

TENNESSEE DEPARTMENT OF PUBLIC HEALTH

OFFICE CORRESPONDENCE

FROM	TO	DATE

DATE: August 4, 1980

TO: Files

FROM: Ruth Yates

SUBJECT: Phone conversation with Ken Harris, Oil Service Company
Columbia, Maury Co.

Mr. Harris called to inquire about the U.S. EPA's notification. I gave him the number in Atlanta and asked him to call directly. I also asked Betty Willis with EPA to call Mr. Harris.

Mr. Harris said that he was having no problems with his treatment facility. He said that he limited incoming wastes to mainly water soluble oils and that he did not accept metal plating wastes. A recent analysis of his effluent to the sewer was described by him to be:

Parameter	Observed Value	City's standard as relatved to me by Mr. Harris
O & G	36.4-53.2 ppm	100 ppm
Cu	< 0.02 ppm	1.0 ppm
Cr	< 0.05 pm	0.5 ppm
Ni	0.26 ppm	3.0 ppm
Pb	< 0.02 ppm	1.0 ppm
Zn	0.14 ppm	2.0 ppm
Cd	< 0.005 ppm	1.0 ppm

This sample analysis did not include other organics but he had mentioned to me earlier that his contract lab has screened wastes for organics before. He said that he batch discharges about once every 3-4 weeks.

R.Y.

FROM	DATE
RY	8/6/80
TO	
JRS	8-12
JDH	8-12
~~JW~~	
~~DS~~	
Burn	8-8

RY/krw 5/10

cc: Barry Silken

PH-0001
SR 3/77

REFERENCE NO. 10

Hawley's Condensed Chemical Dictionary

ELEVENTH EDITION

Revised by

N. Irving Sax
and
Richard J. Lewis, Sr.

VNR VAN NOSTRAND REINHOLD
New York

Derivation: Sulfonation of naphthalene with fuming sulfuric acid at low temperature followed by separation from the 1,6-isomer.
Use: Dye intermediate.

Arndt-Eistert synthesis. Procedure for converting an acid to its next higher homolog.

"Arnel."[352] TM for an acetate fiber made from cellulose triacetate. It has a higher melting point, and is less soluble than cellulose acetate.
See acetate fiber, cellulose triacetate.

"Arnox"[245]. TM for a family of 1-component liquid and solid epoxy resins designed for compression and transfer molding, injection molding, filament winding and pultrusion.

aromatic. (arene). A major group of unsaturated cyclic hydrocarbons containing one or more rings, these are typified by benzene which has a 6-carbon ring containing three double bonds. The vast number of compounds of this important group derived chiefly from petroleum and coal tar are rather highly reactive and chemically versatile. The name is due to the strong and not unpleasant odor characteristic of most substances of this nature. Certain 5-membered cyclic compounds such as the furan group (heterocyclic) are analogous to aromatic compounds. *Note*: The term "aromatic" is often used in the perfume and fragrance industries to describe essential oils which are not aromatic in the chemical sense.

aromaticity. A stable electron shell configuration in organic molecules, especially those related to benzene.
See resonance, orbital theory.

aromatization. See hydroforming.

"Aromin."[51] TM for a highly aromatic solvent widely used as a carrier for chemical pesticides.

Arrhenius, Svante. (1859–1927) A native of Sweden, he won the Nobel prize in chemistry in 1903. He is best known for his fundamental investigations on electrolytic dissociation of compounds in water and other solvents, and for his basic equation stating the increase in the rate of a chemical reaction with rise in temperature:

$$\frac{d \ln k}{dT} = \frac{A}{RT^2}$$

in which, k is the specific reaction velocity, T is the absolute temperature, A is a constant usually referred to as the energy of activation of the reaction, and R is the gas law constant.

arsacetin. (sodium acetylarsanilate; sodium p-acetyl aminophenylarsonate).
$CH_3CONHC_6H_4AsO(OH)ONa$.
Properties: White, crystalline powder; odorless; tasteless; free of arsenous or arsenic acid; solutions will admit of thorough sterilization. Soluble in cold water, but more so in warm water.
Use: Medicine (antisyphilitic).

arsanilic acid. (atoxylic acid; p-aminobenzenearsonic acid; p-aminophenylarsonic acid).
$C_6H_4 \cdot C_6H_8AsNO_3$.
Properties: White, crystalline powder; practically odorless; soluble in hot water; slightly soluble in cold water, alcohol, and acetic acid; insoluble in acetone, benzene, chloroform, and ether. Mp 232C.
Derivation: By condensing aniline with arsenic acid removing the excess of aniline by steam distillation in alkaline solution and setting the acid free by hydrochloric acid.
Hazard: Yields flammable vapors on heating above melting point. A poison.
Use: Arsanilates, manufacture of arsenical medicinal compounds such as arsphenamine, etc., veterinary medicine, grasshopper bait.

arsenic. As. CAS: 7440-38-2. A nonmetallic element of atomic number 33, group VA of Periodic Table, aw 74.9216, valence=2,3,5; no stable isotopes.
Properties: Silver-gray, brittle, crystalline solid that darkens in moist air. Allotropic forms: black, amorphous solid (β-arsenic), yellow, crystalline solid, d 5.72 (commercial product ranges from 5.6 to 5.9), mp 814C (36 atm), sublimes at 613C (1 atm), Mohs hardness 3.5, insoluble in water, caustic and nonoxidizing acids. Attacked by hydrochloric acid in presence of oxidant. Reacts with nitric acid. Low thermal conductivity; a semiconductor.
Derivation: Flue dust of copper and lead smelters from which it is obtained as white arsenic (arsenic trioxide) in varying degrees of purity. This is reduced with charcoal. The commercial grade is not made in US.
Grade: Technical, crude (90–95%), refined (99%), semiconductor grade 99.999%, single crystals.
Hazard: Carcinogen and mutagen. TLV OSHA standard for employee exposure is 10 μg/m3 of air. Respirators required for worker exposure to atmospheres of over 500 μg/m3. ACGIH TLV is 200 μg/m3 (arsenic and soluble compounds).
Uses (metallic form): Alloying additive for metals, especially lead and copper as shot, battery grids, cable sheaths, boiler tubes. High-purity (semiconductor) grade: used to make gallium arsenide

"Brush-Rhap"[266]. TM for butyl and 2-ethylhexyl esters or amine salts of 2,4,5-trichlorophenoxyacetic acid. Available in various concentrations of active ingredient and in combination with esters of 2,4-dichlorophenoxyacetic acid.
Used as a herbicide.

"BRV.[50]" TM for a heavy, high-boiling coaltar distillate.
Properties: Dark, coal-tar oil, d 1.14–1.18 (25/25C). Engler specific viscosity 5–10 (50C), distillation 26% max at 355C. Combustible.
Use: Rubber plasticizer, softener, and reclaiming oil; dispersing agent.

"Brymul"[51]. TM for an emulsifiable grade of cleaner for general use on metals, etc. Contains Stoddard-type solvent.
Hazard: Moderate fire risk.

"Bryton"[544]. TM for a series of oil-soluble petroleum sulfonates
Use: Detergent dispersants, rust-inhibiting agents, and alkaline carriers and as additives to motor oils and diesel fuels.

B-stage resin. (resitol). A thermosetting phenolformaldehyde type resin which has been thermally reactive beyond the A-stage so that the product has only partial solubility in common solvents (alcohols, ketones) and is not fully fusible even at 150–180C. The B-stage resin has limited commercial use.

BT. (*Bacillus thuringiensis*). A species of bacteria used as a pesticide for agricultural crops. It is of the stomach-poison type and has been approved for commercial use.

"BTC"[328]. TM for a series of cationic quaternary ammonium chlorides generally alkyldimethylbenzylammonium chloride.
Use: Disinfectant, deodorant, germicide, fungicide, algacide, slimicide.

BTDA. See 3,3',4,4'-benzophenone tetracarboxylic dianhydride.

Btu. (British thermal unit). The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit (usually from 39 to 40F). This is the accepted standard for the comparison of heating values of fuels. For example, fuel gases range from 100 (low producer gas) to 3200 (pure butane) Btu per cu ft. The usual standard for a city gas is approximately 500 Btu.

BTX. Commercial abbreviation for benzene, toluene, xylene, the three major aromatic compounds.

Bu. Informal abbreviation for butyl.

bubble cap column. See tower, distillation.

Bucherer reaction. A procedure for preparation of β-naphthylamine by heating β-naphthol with a water solution of ammonium sulfite. "A sulfite solution is prepared by saturating concentrated ammonia solution with sulfur dioxide and adding an equal volume of concentrated ammonia solution, β-naphthol is added and the charge is heated in an autoclave provided with a stirrer or a shaking mechanism." (L.F. Fieser) This reaction is also involved in the preparation of several azo dye intermediates, e.g., Tobias acid.

Bucherer-Bergs reaction. Preparation of hydantoin from carbonyl compound by reaction with potassium cyanide and ammonium carbonate, or from the corresponding cyanohydrin and ammonium carbonate.

Bucherer carbazole synthesis. Formation of carbazoles from naphthols, or naphthylamines, aryl hydrazines, and sodium bisulfite.

Buchner-Curtius-Schlotterbeck reaction. Formation of keto compounds from aldehydes and aliphatic diazo compounds; ethylene oxides may also be formed.

Buchner, Eduard. (1860-1917) A German chemist who was awarded the Nobel prize for chemistry in 1907. His works included the synthesis of diiodoacetamid, alcoholic fermentation caused by enzymes, as well as the discovery of zymase, the first enzyme to be isolated. He received his PhD at the University of Munich, where he became a lecturer. Later, he taught and performed research at Tubingen, Berlin, and Wurzburg.

Buchner method of ring enlargement. Diazoacetic acid ester reacts with benzene and homologs to give the corresponding esters of noncaradienic acid, transformed at high. temperatures to derivatives of cycloheptatriene, phenylacetic acid and β-phenylpropionic acid (when one or more methyl groups are present in the initial hydrocarbon).

buclizine hydrochloride. $C_{28}H_{33}ClN_2 \cdot 2HCl$.
1-p-chlorobenzhydryl-4-(p-(tert)-butylbenzyl)piperazinedihydrochloride.
Use: Medicine (antihistamine).

bucket elevator. See conveyor (5).

(3)

sions can be filtered by means of forced flow electrophoresis.

Electrophoresis is important in the study of proteins because the molecules of such materials act like colloidal particles and their charge is positive or negative according to whether the surrounding solution is acidic or basic. Thus, the acidity of the solution can be used to control the direction in which a protein moves upon electrophoresis. It has been found that electrophoresis can be carried out more efficiently under zero gravity conditions in outer space than on Earth.

See also electrodeposition.

electroplating. The deposition of a thin layer or coating of metal, (e.g., chromium, nickel, copper, silver, etc.) on an object by passing an electric current through an aqueous solution of a salt containing ions of the element being deposited, for example, Cu^{++}. The material being plated (usually a metal but often a plastic) constitutes the cathode. The anode is often composed of the metal being deposited; ideally it dissolves as the process proceeds. The thin layer deposited is sometimes composed of two or more metals, in which case it is an alloy. The solution or plating bath contains dissolved salts of all the metals being deposited. Electrolytic cells are used for this process.

The anode must be an electrical conductor but may or may not be of the same chemical composition as the material being deposited, and may or may not dissolve during the process. The purpose of electroplating is usually protection of the base metal from corrosion. Silver is electroplated on copper for economy reasons; plastics may be electroplated for decorative effects.

See also electrophoresis, protective coating, electroless coating, throwing power, current density.

electropolishing. A nonmechanical method of polishing metal surfaces by a method that is actually the reverse of electroplating. This is achieved by making the object to be polished the anode in an electrolytic circuit, the cathode usually being carbon. The electrolytes used are phosphoric, hydrofluoric, nitric, or sulfuric acids (sometimes called polishing acids).

electrostatic bond. Alternative name for an ionic bond.

See bond, chemical.

electrostatic coating. A metal painting technique in which electrostatically charged pigment particles are sprayed onto a substrate metal followed by baking. The electric charge attracts the particles to the metal and holds them in place until heat treatment is applied. Maintenance of the charge is thus essential; factors affecting this are relative humidity (the lower the better) and the chemical nature of the pigment, e.g., phthalocyanine blue retains the charge much longer than titanium dioxide.

electrostatic precipitator. See Cottrell.

electrovalent bond. Alternative name for an ionic bond.

See bond, chemical.

electrowinning. The technique of extracting a metal from its soluble salt by an electrolytic cell. It is used in recovery of zinc, cobalt, chromium, and manganese, and has recently been applied to copper when in the form of a silicate ore. For any specific metal, the salt in solution is subjected to electrolysis and is electrodeposited on a cathode made of the metal being extracted.

element. One of the 109 presently known kinds of substances that comprise all matter at and above the atomic level. According to a theory that has gained acceptance, the lightest elements were formed in less than half an hour from a primordial complex called ylem, a mixture of neutrons and electromagnetic radiation. The smallest unit of any element is the atom. All the atoms of a given element are identical in nuclear charge and number of electrons and protons, but they may differ in mass, e.g., hydrogen has mass numbers of 1, 2, and 3, called hydrogen, deuterium, and tritium, respectively. These are the isotopes of hydrgen; most elements have isotopic forms which are due to the presence of one or more extra neutrons in the nucleus. The atomic number of an element indicates its position in the Periodic Table and represents the number of protons present, which is the same as the number of electrons.

All elements heavier than lead are unstable and radioactive. About 90% of the earth's crust is made up of elements with even numbers of protons and neutrons. No stable elements heavier than nitrogen have an odd number of both protons and neutrons. Elements of even atomic number normally have several isotopes while those of odd atomic number never have more than two stable isotopes. All elements beyond uranium (transuranic) were nonexistent in 1940. They are artificially created by bombardment of other elements with neutrons or other heavy particles. Research on new elements is actively carried on at the Lawrence Livermore Laboratories which reported discovery of Element 106 in 1974. Creation of Element 109 was announced in 1982. A single atom of it was made by West Germany physicists by bombarding Bi-209 with Fe-58 nu-

clei. Many more (possibly
cally possible according
See also Periodic Table,
abundance. *Note*: For orig
cleogenesis.

elemi. A soft, balsam-like
tree in the Philippines, so
carbons, but not in petrol
and ketones.
Use: Plasticizer, adhesion
cements and adhesives, w
ing inks, textile and pap
waterproofing, engraving

"Elprene."[41] TM for a se
ber coating of the neopre
maintenance coating.

Eltekoff reaction. Produ
hydrocarbons by meth
methyl choride or meth
of lead oxide or calciun
tures.

elutriation. A process
and settling which sep
finely divided solid into
weight. It is especially
cles below the usual s
for pigments, clay dre

"Elvace."[36] TM for a se
ene emulsions.

"Elvanol."[28] TM for v
alcohol.

"EMA" Resins.[58] TM
dride copolymers. W
serve as dispersing a
gents, thickeners, bind
fiers.

embosser. See fiber ro

embrittlement. Harde
steel) or of an ABS
strength and impairm
erties. In metals, the
to hydrogen, though
sion also are involv
such as ABS resins,
mation of a vitreous
tion of the butadiene
brittlement due to
pressurized-water re
rupture of reactor w
of trouble in reactor

Hazard (liquid): By ingestion and inhalation; skin irritant.
See also polymer, stereospecific.

polybutene. See polybutylene.

polybutylene. (polybutene; polyisobutylene; polyisobutene). Any of several thermoplastic isotactic (stereo-regular) polymers of isobutene of varying molecular weight, also polymers of butene-1 and butene-2. Butyl rubber is a type of polyisobutene to which has been added 2% of isoprene, which provides sulfur linkage sites for vulcanization. Isobutene can be homopolymerized to various degrees in chains containing from 10 to 1000 units, the viscosity increasing with molecular weight. Combustible.
See also "Vistanex."
Use: Lubricating-oil additive, hot-melt adhesives, sealing tapes, special sealants, cable insulation, polymer modifier, viscosity index improvers, films and coatings.

polybutylene terephthalate. An engineering plastic derived from 1,4-butanediol, it is a thermoplastic polyester with a broad spectrum of uses.

"Polycarbafil."[539] TM for a glass fiber-reinforced polycarbonate.

polycarbonate. $(COOC_6H_5C(CH_3)_2C_6H_5O)_n$.
A synthetic thermoplastic resin derived from bisphenol A and phosgene, a linear polyester of carbonic acid: Can be formed from any dihydroxy compound and any carbonate diester, or by ester interchange. Polymerization may be in aqueous emulsion or in nonaqueous solution.
Properties: Transparent (90% light transmission), noncorrosive, weather and ozone-resistant, nontoxic, stain-resistant. Combustible but self-extinguishing, low water absorption, high impact strength, heat-resistant, high dielectric strength, dimensionally stable, soluble in chlorinated hydrocarbons and attacked by strong alkalies and aromatic hydrocarbons, stable to mineral acids, insoluble in aliphatic alcohols. Excellent for all molding methods, extrusion, thermoforming etc.; easily fabricated by all methods including thermoforming and fluidized bed coating.
Use: Molded products, solution-cast or extruded film, structural parts, tubes and piping, prosthetic devices, meter face plates, nonbreakable windows, street-light globes, household appliances.

polycarboxylic acid. An organic acid containing two or more carboxyl (COOH) groups.

polychlor. General name for synthetic chlorinated hydrocarbons.
Use: Pesticides.

polychlorinated biphenyl. (PCB).
CAS: 1336-36-3. One of several aromatic compounds containing two benzene nuclei with two or more substituent chlorine atoms. They are colorless liquids with d 1.4–1.5. Because of their persistance, toxicity, and ecological damage via water pollution their manufacture was discontinued in the US in 1976.
Hazard: Highly toxic.

polychloroprene. See neoprene.

polychlorotrifluoroethylene. (PCTFE).
See chlorotrifluoroethylene polymer.

"Polycin."[202] TM for (1) an elastic, tacky, gel-like solid resulting from the polymerization of castor oil, used in rubber compounding, floor tile manufacture, and as a polymeric plasticizer; (2) a series of polyols used in the preparation and curing of urethane polymers for protective coatings, foamed insulation, and elastomers.

"Polyco."[65] TM for a series of thermoplastic polymers in the form of water emulsions or solvent solutions, applied to vinyl acetate polymers and copolymers, butadiene-styrene copolymer latics, polystyrenes, vinyl and vinylidene chloride copolymers, acrylic copolymers and water-soluble polyacrylates.
Use: Adhesives and coatings, in paint, leather, textiles, paper, cosmetics, and construction fields.

polycondensation. See condensation (1), polymerization.

polycoumarone resin. See coumarone-indene resin.

polycyclic. An organic compound having three or more ring structures, which may be the same or different, e.g., anthracene, naphthacene.
See polynuclear.

poly(1-4-cyclohexylenedimethylene)terephthalate. TM "Kodel." A linear polyester film or fiber obtained by condensation of terephthalic acid with 1,4-cyclohexanedimethanol. It has good electrical resistivity and hydrolytic stability.
Use: Carpet fibers and chemically resistant films.
See also terephthalic acid.

"Polycyclol 1222."[214] TM for an intermediate for the preparation of alkyd-type resins used for coatings. These are known by the coined name "cyclyd."

poly-1,1-dihydroperfluorobutyl acrylate.
Properties: White, rubber-like polymer. D 1.5, be-

Use: Bacteriostat in soaps and detergents, plastics.

1,1,1-trichloroethane. (methyl chloroform). CAS: 71-55-6. CH_3CCl_3.
Properties: Colorless liquid, d 1.325, bp 75C, fp −38C, insoluble in water, soluble in alcohol and ether, flash p none. Nonflammable.
Hazard: Irritant to eyes and tissue. TLV: 350 ppm in air.
Use: Solvent for cleaning precision instruments, metal degreasing, pesticide, textile processing.

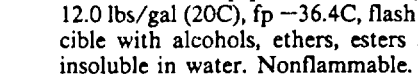
1,1,2-trichloroethane. (vinyl tichloride; β-trichloroethane). CAS: 79-00-5. $CHCl_2CH_2Cl$.
Properties: Clear, colorless liquid, characteristic sweet odor, bp 113.7C, d 1.4432 (20C/4C), refr index 1.4458, vap press 16.7 mm (20C), bulk d 12.0 lbs/gal (20C), fp −36.4C, flash p none. Miscible with alcohols, ethers, esters and ketones; insoluble in water. Nonflammable.
Grade: Technical.
Hazard: Irritant, absorbed by skin. TLV: 10 ppm in air.
Use: Solvent for fats, oils, waxes, resins, other products; organic synthesis.

trichloroethanol. CAS: 115-20-8. CCl_3CH_2OH.
Properties: Viscous liquid, ether-like odor, hygroscopic. Slightly soluble in water, miscible with alcohol, ether, and carbon tetrachloride. Bp 150C, fp 13C, d 1.541 (25/4C). Combustible.
Use: Intermediate, anesthetic.

trichloroethylene. (tri). CAS: 79-01-6. $CHCl{:}CCl_2$.
Properties: Stable, low-boiling, colorless, photoreactive liquid; chloroform-like odor; will not attack the common metals even in the presence of moisture. Bp 86.7C, fp −73C, d 1.456–1.462 (25/25C), refr index 1.4735 (27C), miscible with common organic solvents, slightly soluble in water. Nonflammable.
Derivation: From tetrachloroethane by treatment with lime or alkali in the presence of water, or by thermal decomposition, followed by steam distillation.
Grade: USP, technical, high purity, electronic, metal degreasing, extraction.
Hazard: Toxic by inhalation. Use as solvent not permitted in some states. FDA has prohibited its used in foods, drugs, and cosmetics. TLV: 50 ppm in air.
Use: Metal degreasing; extraction solvent for oils, fats, waxes; solvent dyeing; dry cleaning; refrigerant and heat exchange liquid; fumigant; cleaning and drying electronic parts; diluent in paints and adhesives; textile processing; chemical intermediate; aerospace operations (flushing liquid oxygen).

trichlorofluoromethane. (fluorotrichloromethane; fluorocarbon-11). CAS: 75-69-4. CCl_3F.
Properties: Colorless, nearly odorless, volatile liquid. Bp 23.7C, fp −111C, d 1.494 (17.2C), critical pressure 43.2 atmospheres. Noncombustible.
Derivation: From carbon tetrachloride and hafnium, in the presence of fluorinating agents such as antimony tri- and pentafluoride.
Grade: Technical, 99.9% min.
Hazard: TLV: CL of 1000 ppm in air.
Use: Solvent, fire extinguishers, chemical intermediate, blowing agent.

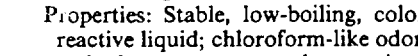
trichloroisocyanuric acid. (1,3,5-trichloro-s-triazine-2,4,6-trione). CAS: 87-90-1.



$OCNClCONClCONCl$.
Properties: White, slightly hygroscopic ,crystalline powder or granules; loose bulk d 31 lbs/cu ft, granular 60 lbs/cu ft; available chlorine 85%; decomposes 225C.
Hazard: Fire risk in contact with organic materials, strong oxidizing agent. Toxic by ingestion.
Use: Active ingredient in household dry bleaches, dishwashing compounds, scouring powders, detergent-sanitizers, commercial laundry bleaches, swimming pool disinfectant, bactericide, algicide, bleach, and deodorant.

trichloroisopropyl alcohol. See isopral.

trichloromelamine. (N,N′,N′-trichloro-2,4,6-triamine-1,3,5-triazine).



$NC(NHCl)NC(NHCl)NC(NHCl)$.
Properties: Fine, white powder, slightly soluble in water and glacial acetic acid, insoluble in carbon tetrachloride and benzene, pH of saturated aqueous solution 4, autoign temperature 320F (160C).
Derivation: By chlorination of melamine.
Grade: 89% available chlorine.
Hazard: Dangerous fire risk, can ignite spontaneously in contact with reactive organic materials.
Use: Chlorine bleach and bactericide.

trichloromethane. See chloroform.

α-(trichloromethyl)benzyl acetate. See trichloromethylphenylcarbinyl acetate.

trichloromethyl chloroformate. (diphosgene). $ClCOOCCl_3$.
Properties: Colorless liquid; odor similar to phosgene (new mown hay); decomposed by heat, po-

rous substances, act
tion of phosgene), a
soluble in alcohol, l
(15C), bp 127–128C
(air = 1), refr index 1
ible.
Derivation: (a) By cl
(b) by chlorinating
both methods the n
is then separated by
Grade: Technical.
Hazard: Toxic by inh
irritant to tissue.
Use: Organic synthes

trichloromethyl ether.
Properties: Liquid; pu
bp 130–132C; solut
ether; insoluble in v
Hazard: Strong irrita
lachrymatory fume

N-(trichloromethylme
mide. See captan.

trichloromethylphenyl
(α-[trichloromethyl
CAS: 90-17-5. C_6
Properties: White, c
odor; mp 86–88C;
alcohol.
Use: Perfumes, fixat
fumes.

trichloromethylphosp
$CCl_3PO(OH)_2$.
Properties: Soluble i
in benzene and he
Use: Catalyst and c

1,1,1-trichloro-2-met
butanol.

trichloromethylsulfer
methyl mercaptan)
$ClSCCl_3$.
Properties: Yellow,
Mildly decompose
action of oxidizing
rine, etc. D 1.722
poses), vap d 6.41
(20C), insoluble i
supports combusti
Derivation: Chlorin
phosgene, or meth
Grade: Technical.
Hazard: Toxic by in
irritant to eyes an
Use: Organic synth
gant.

REFERENCE NO. 11

BLACK & VEATCH Waste Science, Inc.
Philadelphia Office

MEMORANDUM

USEPA Region IV
Treatment Plant/Oil Services Co.
Facility Status (2)

BVWS Project 52012.545
BVWS File N
February 10, 1995
0935

To: Treatment Plant/Oil Services Co. File

From: Michael Ferrari MF

On this date I spoke with Jim Smith (JS), Wastewater Treatment Coordinator at the City of Columbia [(615) 388-2419], regarding the past practices and the current status of the Treatment Plant facility.

The former City of Columbia Wastewater Treatment Plant has not been in operation since the late 1980's. When the facility was in operation, there were holding tanks used in the separation processes. Since the closing of the facility, the tanks have been either filled with concrete or completely removed. In addition, all buildings previously located onsite have been removed.

There has not been any testing at the site since its closing. Currently, the land at the former facility is not being used.

REFERENCE NO. 12

BLACK & VEATCH Waste Science, Inc.
Philadelphia Office

MEMORANDUM

USEPA Region IV
Treatment Plant/Oil Services Co.
Columbia Power & Water Service Area

BVWS Project 52012.545
BVWS File N
February 13, 1995
1000

To: Treatment Plant/Oil Services Co. File

From: Michael Ferrari MF

On this date I spoke with Kelly Powell (KP), Water Superintendent for Columbia Power & Water (CPW) in Columbia, Tennessee [(615) 388-4833], regarding their service area and surface water intakes.

KP said that CPW currently has approximately 15,500 connections, and they obtain all of their water from one intake on the Duck River. The intake is located at mile 134 on the Duck River, which is approximately 1 mile upstream from the Treatment Plant facility. KP said that there are four suppliers of water throughout Maury County, but CPW is the only supplier for the City of Columbia and the surrounding area.

According to KP, very few people in the Columbia area obtain their drinking water from private wells. He also confirmed that recreational boating and fishing is very common in the Duck River in the Columbia area.

REFERENCE NO. 13

STATE OF TENNESSEE

DEPARTMENT OF CONSERVATION

DIVISION OF GEOLOGY

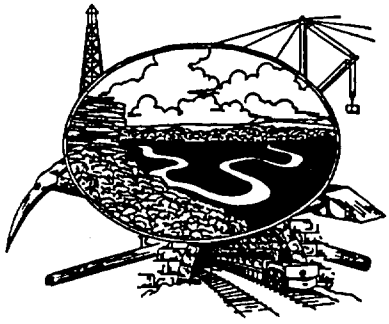
REPORT OF INVESTIGATIONS No. 4

GROUND WATER IN THE CENTRAL BASIN OF TENNESSEE

A Progress Report

By

ROY NEWCOME, JR.



Prepared in cooperation with the U. S. Geological Survey

NASHVILLE, TENNESSEE

1958

GEOLOGY

Structure of the Rocks

Physiographically, the Central Basin is the result of erosion of a low structural dome whose crest is in southern Rutherford County. The dome represents the southern end of the Cincinnati Arch, an elongated area of upwarped rocks extending northward through Central Kentucky into Ohio and Indiana. During the upwarping and doming the rocks at the crest of the dome were stretched, resulting in the formation of joints. The weakened carbonate rocks were readily subject to solution and erosion, with the result that a topographic basin now occupies the top of the structural dome.

Although jointing is a prominent feature of Central Basin rocks, there is little evidence of differential movement along the joints. The formations lie in the same relative positions in which they were deposited. Minor folding of the rocks is not unusual, but it is of a local nature only.

Rock Formations of the Central Basin

The rock formations of the Central Basin are almost entirely limestones of Ordovician age. They differ greatly in color, texture, and chemical purity. Erosion of the structural dome has resulted in the exposure of concentric rings of progressively younger rocks as distance from the center of the Central Basin increases. The formations dip away from the center at about 15 feet per mile.

The oldest rocks exposed are those of the Murfreesboro limestone, which consists of about 400 feet of fine-grained bluish-gray limestone. The upper 100 feet of the Murfreesboro has been removed at the locality of deepest erosion. The youngest rock exposed that is of hydrologic signifiicance in the basin is the Catheys limestone. Outcrops of formations younger than the Catheys are restricted largely to the hills that remain as erosional remnants of the Highland Rim Plateau.

Between the Murfreesboro and Catheys limestones is approximately 500 feet of limestone of six formations, as represented in the accompanying columnar section. (See table 1.) C. W. Wilson, Jr., (1949) has described in detail the stratigraphy of Central Tennessee.

GROUND WATER

Occurrence

An evaluation of the water-yielding properties of the rock formations of the Central Basin should consider two important factors, depth and solubility of the rocks. Nearly all the ground water in the region is contained in cavities formed, or enlarged, by solution of the limestone. These cavities, termed "solution channels," had their origin, for the most part, in openings along joints and bedding planes, through which water was provided relatively easy access to the rocks below the land surface. With such a start, water containing carbonic and organic acids derived from the air or leached from the soil has formed by solution of the limestone a network of water-carrying subterranean channels which are common in limestone regions.

Solution of the rocks has not progressed everywhere at the same rate nor to the same extent. The composition of the rocks greatly affects the rate of solution. Generally, the purer limestones are more easily dissolved than rocks containing appreciable amounts of nearly insoluble silty and clayey material, especially those in which the insoluble material is concentrated in layers.

Solution proceeds more slowly as depth increases. Crevices, that are open and of appreciable size near the surface, become less pronounced with depth, owing both to the less severe stretching undergone by the deeper rocks at the time of uplift and to the weight of overlying rocks. In most places in the basin substantial solution has not progressed beyond a depth of 300 feet. Records of the depth or depths of occurrence of water in 650 wells, totaling 700 occurrences, show that 75 percent of the water-bearing openings occur at depths of less than 100 feet and 90 percent at depths of less than 300 feet.

Water-Yielding Properties of the Rocks

The results of this study indicate that the individual rock formations of the Central Basin differ in their ability to transmit and yield water. Information on these differences, together with information on the thickness of the rocks and the areal distribution of their outcrops and on the topography, forms the basis for a prediction of the ground-water prospects and the maximum feasible depth of drilling at any specific locality.

Many wells in the Central Basin have been drilled several hundred feet below the depth at which water could reasonably be expected.

TABLE 1.–STRATIGRAPHIC SECTION OF THE CENTRAL BASIN OF TENNESSSEE

System	Group	Formation	Approx. Thickness (feet)	Remarks
ORDOVICIAN	Richmond	Sequatchie, Fernvale and Mannie formations. (Orh)	0–75	Sequatchie: Greenish-gray mudstone. Fernvale: Coarse-grained varicolored limestone. Mannie: Varicolored shale.
	Maysville	Leipers limestone (Ol)	0–100	Dark-gray fine- to medium-grained limestone. Thin to medium bedded. Locally phosphatic.
	Nashville (Trenton)	Catheys limestone (Ocy)	50–200	Dark-blue fine- to coarse-grained limestone. Thin to medium bedded. Phosphatic in places.
		Bigby-Cannon limestone (Oby-Ocn)*	50–100	Bigby facies and Cannon facies intergrade laterally. Bigby: Blue medium-grained phosphatic limestone. Cannon: Gray fine- to medium-grained limestone. Light-gray dense limestone termed "Dove" occurs as lentils interbedded with Bigby and Cannon facies.
		Hermitage formation (Oh)	60–100	Dark-blue fine-grained argillaceous limestone. Lower part thinly laminated with shale partings.
	Stones River	Carters limestone (Oc)	65	Light-brown dense limestone. Contains thin bentonite beds. Thin bedded near top, massive below. Dolomitic in places.
		Lebanon limestone (Olb)	115	Bluish-gray fine-grained thin- to medium-bedded limestone with thin shale partings.
		Ridley limestone (Or)	105	Light-gray dense, massive limestone.
		Pierce limestone (Op)	25	Gray medium- to coarse-grained silty limestone.
		Murfreesboro limestone (Om)	420	Blue and brown fine-grained limestone.
		Wells Creek dolomite	0–75	Silty dolomite and dolomitic limestone. Usually green owing to presence of glauconite.
CAMBRIAN AND ORDOVICIAN		Knox dolomite (O-Ck)	5,000±	Gray and brown fine-grained to granular dolomite and dense white limestone. Chert common.

The classification of the Bigby-Cannon limestone in this report is in accord with recent published reports and usage by the Tennessee Division of Geology, but it does not coincide with the classification used by the U. S. Geological Survey.

On the other hand, probably even more wells have been stopped and abandoned when there was still a good chance for obtaining water at greater depth. In situations of both types adequate geologic information might have aided in securing adequate water supplies at reasonable cost.

The following discussion of the water-yielding properties of each formation is based on the available well records and on observations made at wells for which detailed records were not available.

All chemical analyses listed in this report were made by D. F. Farrar, Chemist, Tennessee Division of Geology.

KNOX DOLOMITE (O€k)

The Knox dolomite contains the oldest sedimentary rocks underlying the Central Basin. It is not exposed, its nearest approach to the surface being to within about 300 feet in Rutherford County near Murfreesboro and Lascassas where the Murfreesboro limestone crops out. One well drilled through the Knox in Giles County penetrated approximately 5,000 feet of limestone and dolomite before reaching granite.

Records indicate that the upper 100 feet of the Knox dolomite can be depended upon to yield water to wells. A study of 88 wells penetrating the Knox dolomite shows that water was obtained in the upper 20 feet of the Knox in 52 wells. It was obtained in the upper 50 feet of the Knox in 71 wells. Thus, in more than 80 percent of the wells, water was obtained from zones in the upper 50 feet of the Knox. In many wells water was obtained at two or more levels.

It is difficult to correlate the levels at which water occurs in the Knox dolomite. In some wells water is found at the very top of the Knox, whereas in others less than a mile distant it may be necessary to drill 50 feet or more into the Knox. The upper part of the Knox contains dolomite of several types (coarse granular, silty saccharoidal, dense) along with irregularly spaced beds of very dense light-colored limestone. Water is rarely obtained from the limestone but may be found in any of the dolomitic types, apparently without regard to the lithology. The way in which the water-bearing zones originated is not known, but their existence, in many places more than 400 feet below the depth to which solution normally takes place, points to hydrologic conditions different from those encountered in the overlying formations.

Water from the Knox dolomite varies both in quantity and in quality. In many wells water from younger strata is not cased off, making it very difficult to estimate the yield of the Knox. However, a comparison of the yields of 40 wells penetrating the Knox dolomite

TABLE 2.—CHEMICAL ANALYSES OF WATER FROM WELLS IN THE KNOX DOLOMITE
(parts per million)

County	Well No.	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Dissolved solids	Hardness as $CaCO_3$
BEDFORD	3	0.3	132	10	51	0	254	156	78	4.0	583	370
DAVIDSON	5	.1	371	12	768	0	496	576	1,180	4.5	3,250	975
DAVIDSON	8	.2	122	12	14	0	290	95	21	4.5	576	353
DAVIDSON	17	.2	188	32	147	27	314	282	227	4.0	1,160	598
DAVIDSON	37	.3	462	32	1,450	0	390	823	2,230	2.0	5,440	1,260
DAVIDSON	61	.5	386	6	398	14	246	761	809	2.0	2,350	918
DAVIDSON	125	.2	194	8	153	0	332	242	236	2.3	1,000	517
GILES	4	.6	283	10	326	19	304	453	502	.....	1,770	752
GILES	16	.3	746	21	1,913	0	308	1,670	2,940	3.0	7,640	1,950
JACKSON	9	.8	469	10	1,040	0	398	936	1,640	.....	4,520	1,250
MARSHALL	3	.2	204	24	129	0	322	311	198	3.0	1,060	606
MAURY	3	.1	145	4	37	0	316	111	67	4.8	536	379
MAURY	21	1.0	114	6	6	12	206	123	10	3.8	426	309
RUTHERFORD	42-1	.2	304	12	460	0	290	529	706	4.0	2,220	808
RUTHERFORD	42-2	.1	258	5	322	18	220	457	496	3.5	1,820	665
RUTHERFORD	70	.1	94	3	18	0	258	28	28	4.0	373	247
SUMNER	1	.8	590	39	1,660	47	340	1,260	2,550	.....	6,580	1,630
WILLIAMSON	2	.2	292	12	116	18	268	498	178	3.5	1,440	778
WILLIAMSON	3-2	.2	172	8	16	29	264	187	25	3.0	634	462
WILLIAMSON	5	.1	138	4	32	0	270	146	49	3.0	603	361
WILLIAMSON	6	.3	104	11	23	10	320	12	35	3.0	526	304
WILLIAMSON	8-1	.2	155	12	34	0	330	155	53	4.8	630	435
WILLIAMSON	8-2	.2	134	9	12	0	286	108	18	3.8	450	371
WILLIAMSON	10	.4	138	23	83	21	204	225	127	3.0	722	437
WILLIAMSON	11	.4	324	22	41	22	300	542	63	4.6	1,180	898
WILLIAMSON	12	.1	192	12	64	0	378	204	99	4.5	790	528
WILLIAMSON	13	.2	23	74	9	0	250	153	14	.....	462	362
WILLIAMSON	14	.3	136	16	23	14	278	144	35	4.0	556	404
WILLIAMSON	32	.4	132	3	4	0	324	70	5	3.5	374	342
WILLIAMSON	50	.2	214	7	9	0	338	280	14	4.8	708	563

s yielded less than 1 gallon per minute (gpm), 25 wells yielded 1 gpm, 5 wells yielded 6 to 10 gpm, and only 2 wells yielded more 10 gpm. Probably none of the water-bearing zones in the Knox ishes more than 15 gpm to a well.

The quality of water obtained from wells in the Knox dolomite ends largely upon well location; those wells near the center of the n yield water of better quality than do wells near the margin. The unt of dissolved mineral matter in water from the Knox is seldom than 500 parts per million (ppm) and it often exceeds 1,000 ppm. greatest concentration of wells yielding water from the Knox omite is in northern Williamson County and southern Davidson nty. In that area 13 wells yield water ranging from 500 to 2,500 in dissolved-solids content.

The fluoride content of water from 35 wells yielding water from the ox dolomite in Bedford, Davidson, Giles, Marshall, Maury, Rutherl, and Williamson Counties ranged from 2 to 6.5 ppm. In view of fact that continual use of water having fluoride in excess of 1.5 may cause mottled enamel on children's teeth (Dean, 1936), it be desirable to have fluoride tests made before using water from e wells.

WELLS CREEK DOLOMITE

Directly overlying the Knox dolomite is the easily drilled, very silty omite and dolomitic limestone of the Wells Creek dolomite. It is exposed at the surface but is usually conspicuous in well cuttings use of the striking green color imparted to the rock by the mineral conite. In places glauconite is absent from part or all of the unit, in those places the rock is similar in color to the underlying Knox. Wells Creek dolomite ranges in thickness from less than 5 feet in eastern part of the Central Basin to 80 feet in the west. It is not wn to yield water to wells in the Central Basin.

MURFREESBORO LIMESTONE (Om)

Although the Murfreesboro limestone is 400 feet thick and contains ny easily dissolved beds, the formation in most places is a poor ce of water. This probably is due to the Murfreesboro being ered nearly everywhere by 100 to 600 feet of younger rocks. Excep s are small areas where the formation crops out in central Rutherford nty and at Wilhoite Mills in Marshall County. In the outcrop s the Murfreesboro yields water to most wells. Records of 47 wells led into the formation in Rutherford County show that the M... sboro yielded water to 34 of them. However, elsewhere in the

Central Basin where the Murfreesboro is more deeply buried it yielded water to only 20 of 100 wells.

In the vicinity of Murfreesboro several industries make use of ground water in their processes. In that locality there are at least 12 wells that yield more than 100 gpm each from the Murfreesboro limestone. Most of this water is of good quality. Elsewhere in the Central Basin the Murfreesboro seldom yields water that is not highly mineralized. The formation is a poor source of water except in the areas where it crops out or is very near the land surface.

PIERCE LIMESTONE (Op)

The Pierce is a thin silty limestone overlying the Murfreesboro limestone. As it has a thickness of only 25 feet, its area of outcrop is very small, usually restricted to a thin border about the outcrops of the Murfreesboro. The rock contains 15 percent of insoluble material,* twice as much as the Murfreesboro. Most of the insoluble material is clay and shale occurring as thin partings.

The Pierce limestone is a very poor source of water. Records of 153 wells penetrating the formation show that only 9 obtained water from it.

The thinness of the formation and its high content of insoluble matter, together with its deeply buried position in most places, are probable reasons for its poor water-yielding properties. Water, when encountered in the Pierce limestone, is generally too highly mineralized to be potable.

RIDLEY LIMESTONE (Or)

Probably the most reliable water-bearing formation above the Knox dolomite is the Ridley limestone. The rocks of this formation crop out over a greater area than those of any of the other formations in the Central Basin. Large exposures of the Ridley occur in Rutherford, Bedford, Marshall, and Maury Counties. In those counties the formation is topographically expressed as extensive plains.

The Ridley limestone is a massively bedded formation about 100 feet thick. It contains the purest limestone in the Central Basin, the average content of insoluble material being only 5 percent. The large areas of exposure and the chemical purity of the rock afford favorable conditions for the development of solution channels.

Records are available for 240 wells penetrating the Ridley limestone. The formation yielded water to 118 of the wells. In 65 percent of the

*The percentages of insoluble material expressed in this report are based on a study of insoluble residues on file at the Tennessee Division of Geology, Nashville, Tenn

lding wells, however, the quantity of water obtained from the Ridley ess than 5 gpm. Only 5 percent of the wells yield more than 20 gpm.

Water from the Ridley limestone is usually potable, although in -third of the wells yielding water from the formation there is a ectable odor of hydrogen sulfide.

LEBANON LIMESTONE (Olb)

The Lebanon limestone is well exposed in the Central Basin. It is ut 115 feet thick. In general, the Lebanon outcrops form a border und the large exposures of the Ridley limestone. In addition, there many outliers of the Lebanon limestone within the outcrop areas of Ridley. The Lebanon is usually distinguished by its thin-bedded gy appearance and by the abundant growth of cedar trees that it ports.

Although the content of insoluble material in the Lebanon averages ly 5.5 percent, the material occurs in the form of very thin, closely ced, shale partings. As a result, the formation has a thin-bedded pearance.

Records of 293 wells penetrating the Lebanon show that this mation yielded water to 107 of them, a somewhat lower average than t for the underlying Ridley limestone. This lower average probably due to the resistance to solution provided by the shale partings. This suggested by the fact that half the wells starting in the Ridley yield ter from that formation, whereas only one-fifth of the wells starting the Lebanon yield water from the Lebanon.

The quantity of water to be expected from wells in the Lebanon is out the same as that yielded by wells in the Ridley. About 60 percent the wells yield less than 5 gpm and 5 percent yield more than 20 gpm. Water from the Lebanon limestone is usually of good quality except it it is very hard. Hydrogen sulfide is detected in about one-fourth the wells. It can usually be removed by aeration. Salty water has been countered in about 5 percent of the wells yielding water from the banon.

CARTERS LIMESTONE (Oc)

The Carters limestone is one of the best known formations in the ntral Basin. Well drillers commonly refer to it as the "brown lime." light-brown color contrasts sharply with the dark-blue beds of the erlying Hermitage formation. The Carters is 85 feet thick and consists

mostly of massively bedded limestone. The outcrops are often seen as steep risers between the steps produced by erosion of the Lebanon and Hermitage formations. In the eastern part of the Central Basin the Carters contains four thin beds of altered bentonite (Wilson, 1949, p. 62-65), the uppermost bed being at or near the top of the formation. In the remainder of the Central Basin only the three lower bentonite beds are present. If the calcareous shale partings in the Lebanon limestone are disregarded, the Carters and the Lebanon contain about the same amount of insoluble material. However, the thicker bedding of the Carters makes possible a better development of solution channels where water has access to the rock.

The Carters limestone is restricted as a water-bearing formation, however, by the overlying argillaceous Hermitage formation, which acts as an almost impervious cap preventing the downward seepage of water. For this reason the Carters does not have as good a record for yielding water as its chemical purity and massive bedding would suggest. Throughout the Central Basin the Carters has yielded water to 94 of 313 wells on which records are available. In three-fourths of the yielding wells water was encountered at depths of less than 100 feet. As the Hermitage formation restricts vertical seepage, the Carters must depend upon recharge at the outcrop. It seems that the chances of obtaining a water supply from the Carters are not favorable except where the formation is close enough to the surface to crop out near the area being drilled.

The quantity of water yielded to wells in the Carters limestone is, on the average, slightly greater than that yielded by the Ridley and Lebanon limestones. About 60 percent of the wells yield less than 5 gpm, and 6 percent yield more than 20 gpm.

Water from the Carters is similar in quality to that obtained from the Lebanon limestone. About one-fourth of the wells yield water that contains some hydrogen sulfide.

HERMITAGE FORMATION (Oh)

The Hermitage formation, ranging in thickness from 60 feet in the southern part of the Central Basin to 100 feet in the northern part, contains several members which intergrade laterally. Its identification in the field must take into account the locality, as outcrops of each member have characteristics differing from those of the other members. Wilson (1949, p. 82-102) defines the limits of occurrence of each member. The members differ in their content of fossils, phosphate, silt, and clay. In general the strata of the Hermitage are very dark blue and are

TABLE 7.—CHEMICAL ANALYSES OF WATER FROM WELLS IN THE CARTERS LIMESTONE
(parts per million)

County	Well No.	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Dissolved solids	Hardness as $CaCO_3$
DAVIDSON	9	0.2	179	18	27	22	242	286	42	.....	838	619
DAVIDSON	19	.4	932	40	817	0	756	1,900	480	2.0	4,350	2,490
DAVIDSON	94	.1	121	1	5	0	232	33	7	0	330	304
WILLIAMSON	30	.1	100	1	4	0	270	20	6	0	261	254
WILLIAMSON	31	.3	116	2	2	21	270	36	3	0	335	298
WILSON	8	.3	136	1	23	0	274	107	35	0	464	344

TABLE 8.—CHEMICAL ANALYSES OF WATER FROM WELLS IN THE HERMITAGE FORMATION
(parts per million)

County	Well No.	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Dissolved solids	Hardness as $CaCO_3$
DAVIDSON	7	0.4	144	2	2	21	306	68	3	0	433	368
DAVIDSON	121	.1	102	1	8	0	258	39	12	0	348	296
GILES	1	.4	98	5	7	12	162	122	11	.....	401	265
WILLIAMSON	1	.7	104	7	3	19	296	5	4	.....	328	288
WILLIAMSON	32	.1	86	7	5	0	220	54	6	.5	290	243

easily distinguished from the light-colored underlying Carters limestone. Much of the Hermitage is thinly laminated with shale partings, particularly the lower part.

The shaly nature of the Hermitage formation makes it a poor water bearer. It also forms an effective seal, greatly restricting the downward seepage of water into the underlying formations. Acting as an impervious cap, the Hermitage is responsible for many of the areas of ground-water deficiency near the outer limits of the Central Basin.

Occasionally water is encountered in the Hermitage, usually near the top of the formation in areas where a zone of coquina made up largely of the fossil brachiopod *Dalmanella* is present. This zone is a massively bedded, very fossiliferous, limestone restricted to the western half of the Central Basin.

Available records show that the Hermitage has yielded water to 68 of 267 wells penetrating the formation. About 60 percent of the yielding wells in the Hermitage yield less than 5 gpm. Ten percent yield more than 20 gpm.

Water from the Hermitage formation is generally of good quality, although that from about one-fifth of the wells contains some hydrogen sulfide.

Because of the impervious nature of the Hermitage it is inadvisable to drill into the formation where it lies at a depth exceeding 100 feet. Of the 68 wells yielding water from the Hermitage, only 14 encountered water in the Hermitage at depths of more than 100 feet.

BIGBY-CANNON LIMESTONE (Oby-Ocn) *

The interval between the Hermitage and Catheys formations, ranging from 60 to 100 feet in the Central Basin, is occupied by the Bigby (Oby), Cannon (Ocn), and Dove-colored facies of the Bigby-Cannon limestone. West of a north-south line from Davidson County to Giles County the Hermitage-Catheys interval is occupied by the Bigby facies. East of a north-south line from Sumner County to Lincoln County, the Cannon facies occupies the interval. Between the two lines the facies intergrade.

The Bigby facies is the well-known phosphate rock horizon of Central Tennessee. It is an impure limestone containing about 20 percent of insoluble material. The rock is dark blue when fresh, weathering

*The classification of the Bigby-Cannon limestone in this report is in accord with recent published reports and usage by the Tennessee Division of Geology, but it does not coincide with the classification used by the U. S. Geological Survey.

TABLE 9.—CHEMICAL ANALYSES OF WATER FROM WELLS IN THE BIGBY FACIES
(parts per million)

County	Well No.	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Dissolved solids	Hardness as $CaCO_3$
DAVIDSON	6	0.7	432	41	60	21	204	942	92	.....	1,920	1,240
DAVIDSON	35	.2	484	22	51	0	408	905	78	1.8	1,960	1,300
MAURY	22	.1	362	6	13	0	232	701	21	2.6	1,300	929
MAURY	43	.1	74	1	4	0	166	50	7	0	227	189
MAURY	24-2	.1	110	2	7	0	210	107	11	.5	465	253

TABLE 10.—CHEMICAL ANALYSES OF WATER FROM WELLS IN THE CANNON FACIES
(parts per million)

County	Well No.	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Dissolved solids	Hardness as $CaCO_3$
DAVIDSON	43	0.2	94	2	8	21	214	30	12	0	306	243
MACON	1	.2	101	1	14	45	154	83	21	0	310	256
MOORE	3-1	.....	78	1	1	0	220	16	1	0	250	199
SMITH	11	.1	78	1	50	13	162	39	75	0	300	199
SUMNER	25	.1	96	1	1	9	246	26	2	.5	293	244

to brownish gray on the outcrop. Massive bedding is noted in fresh cuts, but strong crossbedding is seen in the weathered rock.

Rocks of the Cannon facies are nonphosphatic and are in most places finer grained and lighter in color than those of the Bigby facies. The content of insoluble material is only about one-fourth that of the Bigby facies.

A very dense, silt-free limestone, termed the "Dove" because of its very light-gray color, occurs as discontinuous bodies in the Bigby and Cannon facies. It ranges up to 40 feet in thickness and may be divided into two or more beds by the intervening Bigby and Cannon. The lateral extent of the Dove-colored facies is in most places impossible to determine without extensive drilling.

Available records show that water zones were encountered in 48 of 134 wells penetrating the Bigby facies. In about 75 percent of the wells the yield is less than 5 gpm; only 2 wells yield more than 20 gpm. Hydrogen sulfide is present in the water from about one-sixth of the wells in the Bigby facies. The remainder yield water of good quality.

The Cannon facies has yielded water to about 70 of 180 wells on which records are available. The yield and quality of water are recorded for only one-half of the 70 wells. Of those wells on which the records are complete 60 percent yield less than 5 gpm and 12 percent yield more than 20 gpm. The water is similar in quality to that found in the Bigby facies, one-sixth of the wells yielding water having a noticeable content of hydrogen sulfiide. Salty water was reported in four wells.

CATHEYS LIMESTONE (Ocy)

The Catheys limestone is a series of rather silty limestones divided into several facies on the basis of fossils, silt content, and bedding. The formation ranges in thickness from 50 feet in the southwestern part of the Central Basin to 200 feet at the eastern margin. Generally, the Catheys appears as a light-gray granular rock. It is exposed in the valleys of many streams in the outer parts of the Central Basin. In the interior of the Central Basin the formation caps many of the higher hills.

Records are available for 157 wells that have penetrated the Catheys limestone. The formation yielded water to 65 of the wells. Of 47 wells on which the yield is recorded, 60 percent yield less than 5 gpm; 6 percent yield more than 20 gpm. About 70 percent of the wells furnish water of good quality. Hydrogen sulfide is present in water from about one-fourth of the wells.

TABLE 11.—CHEMICAL ANALYSES OF WATER FROM WELLS IN THE CATHEYS LIMESTONE
(parts per million)

County	Well No.	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Dissolved solids	Hardness as $CaCO_3$
DAVIDSON	41	0.1	98	1	5	0	236	53	7	0.2	310	249
DAVIDSON	108	.1	231	3	4	0	300	335	7	.5	860	590
MAURY	46	.2	94	1	16	25	186	40	25	.5	310	239
SUMNER	15	.1	92	2	125	39	156	35	191	3.0	620	258
WILLIAMSON	28-1	.3	105	1	1	0	260	41	1	0	306	266

TABLE 12.—CHEMICAL ANALYSES OF WATER FROM WELLS IN THE LEIPERS LIMESTONE
(parts per million)

County	Well No.	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Dissolved solids	Hardness as $CaCO_3$
DAVIDSON	98-1	0.3	202	2	4	30	226	277	7	1.0	693	513
MACON	3	.2	83	2	62	0	218	31	96	.2	436	214
SUMNER	8	.4	143	2	37	14	128	205	56	.5	663	366
[illegible]	20	.1	118	2	18	0	270	73	28	.8	377	303

LEIPERS LIMESTONE (Ol)

Outcrops of the Leipers limestone are largely restricted to the margin of the Central Basin, very near its boundary with the Highland Rim Plateau. The formation is about 75 feet thick on the perimeter and thins rapidly toward the interior. The rocks of the Leipers are granular, knotty-appearing, blue limestone. The Leipers is phosphatic in places, particularly on the western side of the Central Basin. Commonly the outcrops have a yellowish, earthy appearance.

Springs flowing from the face of the Highland Rim escarpment furnish domestic water supplies to many residents of the outer Central Basin region. Consequently, there is not as much reliance on wells as in the interior of the Central Basin.

Records show that of 55 wells drilled into the Leipers 27 obtained water from this formation. Yield and quality data are available on 18 of the wells. Eight wells yield less than 5 gpm; three wells yield more than 20 gpm. No hydrogen sulfide was reported in water from wells penetrating the Leipers, and only one well was reported to yield salty water.

RICHMOND GROUP (Orh)

In the Central Basin the Richmond group is represented by the Sequatchie, Fernvale, and Mannie formations, none of which crops out over an appreciable area. They are present along the extreme northern and southern margins of the Central Basin.

The Sequatchie, a mudstone, overlies the Leipers limestone. It is overlain by the crystalline limestone of the Fernvale formation, above which is the Mannie shale (as defined by Wilson, 1949, p. 215-218), a series of varicolored shales. The three formations together probably do not exceed 75 feet in thickness.

Little information is available on the occurrence of ground water in the three formations. Of 24 wells recorded in the rocks of Richmond age, only 5 yield water. The water from all 5 wells is of good quality.

Water Levels In Wells

Ground water, in its movement through openings in the rocks, obeys certain physical principles. Knowledge of the principal features of the laws governing the flow of liquids should serve to reduce the uncertainty and financial risk connected with the development of ground-water supplies.

TABLE 18.—CHEMICAL ANALYSIS OF WATER FROM A WELL IN THE RICHMOND GROUP

(parts per million)

County	Well No.	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Dissolved solids	Hardness as $CaCO_3$
DAVIDSON	115	0.1	90	1	7	27	156	41	11	0.5	261	229

Practically all ground water in the Central Basin of Tennessee is confined under artesian pressure in solution channels in the limestone. The pressure in a given channel depends upon the difference in altitude between the channel and the water table in the outcrop area of the formation, and upon the head loss by friction as the water moves through the rocks to the channel. When a well penetrates the channel the confining pressure is released and the water rises in the well. If it so happens that the land-surface elevation at the well is lower than the elevation to which the hydrostatic pressure forces the water, a flowing well results. As water rises in a well its increasing weight acts against the pressure that is forcing water into the well. This results in a steadily decreasing rate of rise until the pressure of the water in the well equals the hydrostatic pressure, and the water is said to have reached its "static" or nonpumping level. In a given aquifer the head generally decreases with distance from the recharge area as a result of friction.

When a well is pumped the water level declines, rapidly at first and then more slowly, until it reaches a state of equilibrium or near-equilibrium. The ratio of the pump discharge to the decline in water level is the specific capacity of the well. It is usually expressed in gallons per minute per foot of drawdown. If the water level is drawn down to the well's intake, the discharge is considered the total yield or "capacity" of the well.

Water levels in wells in the Central Basin fluctuate in accordance with local differences between rates of recharge and discharge. The period of fluctuation may be a part of a day, a day, a season, a year, or several years, depending on the cause. Small diurnal or semidiurnal fluctuations are caused by changes in barometric pressure. In some wells rapid rises in the water level occur during and after nearby rainfall, indicating that the wells are recharged by infiltration, as from nearby streams or sinkholes. Seasonal water-level fluctuations are usually caused by changes in the level of ground water in the recharge area, although they may be caused also by seasonal differences in withdrawal—for example, seasonal changes in withdrawal of water for air conditioning, or seasonal changes in natural discharge of water by vegetation in the discharge area. In general, the deeper the water zone and the greater the distance from the recharge area, the smaller the natural fluctuation of the water level.

Chemical Quality of Ground Water

Generally, with an increase in depth and in distance from the recharge area there is an increase in the mineral content of the water. An exception is the water yielded by the upper part of the Knox

EXPLANATION OF WELL TABLES

In the following tabulation of wells the well number found in the first column corresponds to the well number on the accompanying county map. In the column showing the approximate yield of the wells the term "seep" is used to denote a yield of less than 5 gallons per hour. The word "dry" indicates wells that, according to the driller, yield no water from zones within the rocks. Occasionally a reportedly dry well receives water by seepage from the soil during wet weather.

An asterisk (*) denotes that a chemical analysis of the water from the well is on file at the Tennessee Division of Geology. Many of the analyses are tabulated in the chapters on rock formations in this report.

Symbols are used to indicate the various geologic units in the surface unit and source columns. These symbols and the geologic units they represent are listed below:

O€k	Knox dolomite
Om	Murfreesboro limestone
Op	Pierce limestone
Or	Ridley limestone
Olb	Lebanon limestone
Oc	Carters limestone
Oh	Hermitage formation
Oby-Ocn	Bigby-Cannon limestone *
Oby	Bigby facies
Ocn	Cannon facies
Ocy	Catheys limestone
Ol	Leipers limestone
Orh	Richmond group

Explanation of Carter Coordinate System of Well Location

In the Carter Coordinate System an area is divided into quadrangles covering five minutes of latitude and longitude. Each such quadrangle is divided into 25 equal (1-minute) quadrangles. These quadrangles, or "sections" (not to be confused with the one-mile-square sections of the General Land Office township-and-range system), are numbered starting with 1 in the northeast and ending with 25 in the southwest quadrangle. (See illustration.)

*The classification of the Bigby-Cannon limestone in this report is in accord with recent published reports and usage by the Tennessee Division of Geology, but it does not coincide with the classification used by the U. S. Geological Survey.

Notice that locations are given in reverse order of size—that is, the smallest subdivision to the largest. For example, in the illustration, the location of the well is NE, NE, SE, 11, 2S-54E as it is in the NE quarter of the NE quarter of the SE quarter of section 11 of quadrangle 2S-54E. It is readily seen that to find a well when the location is given, it will be necessary to read the location in reverse, finding quadrangle 2S-54E first, then section 11, and finally the quarter subdivisions, SE, NE, NE.

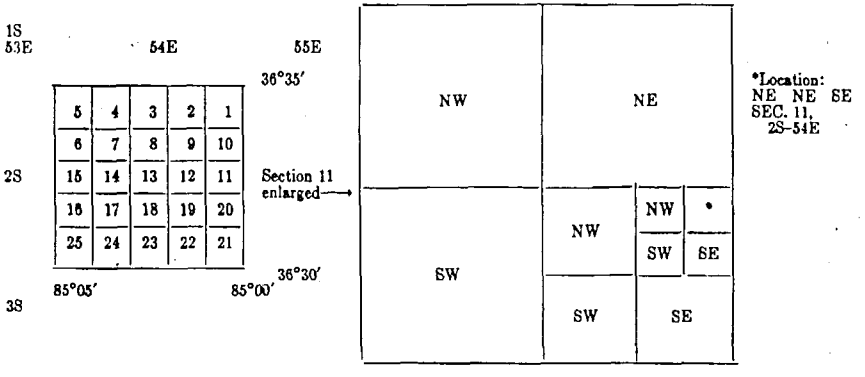


TABLE 25.—RECORDS OF WELLS IN MAURY COUNTY

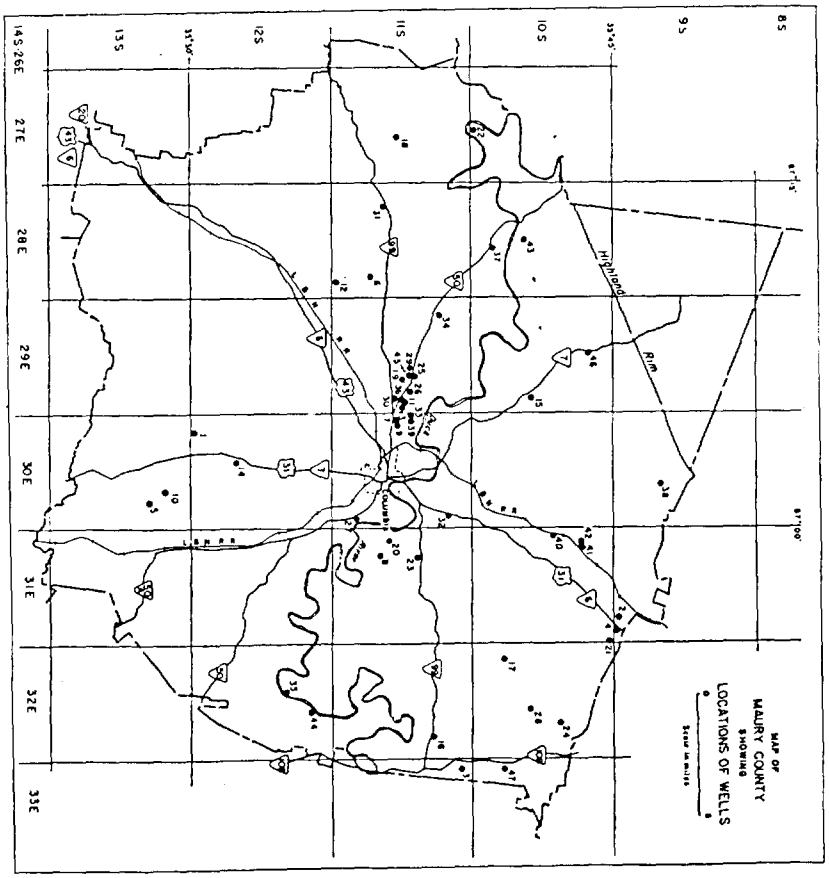
Well No.	Location	Owner	Topographic situation	Altitude (feet)	Surface unit	Depth of well (feet)	Length of casing (feet)	Depth to water zones (feet)	Source	Yield (gallons per minute)	Depth to water level (feet)	Date of measurement	Remarks
1	SE, SE, 25, 12S-30E	Jerry Dowling	Valley	710	Oc	100	.....	98	Olb	20	Flowing	1950	Overflows 3 gpm.
2	SE, SE, 22, 9S-31E	J. W. Howard	Hillside	740	Oby	130	.....	122	Oc	.....	30	5-49	
3	SE, NW, 5, 11S-33E	K. L. Osteen	Low hill	641	Or	530	.....	520	O-Ck*	.....	20	11-50	
4	SE, SW, 21, 9S-31E	Town of Spring Hill	Hillside	762	Oh	410	110	95	Oc	4	67	7-48	Hydrogen sulfide odor.
5	SE, NE, 9, 13S-30E	James Scott	Valley	900	Oh	267	18	40	Oh	Seep	.....	.....	
6	NW, SW, 20, 11S-28E	Hugh Patton	Hilltop	650	Oby	81	.....	.....	.....	Dry	.....	.....	
7	NE, SW, 15, 18S-30E	R. E. Ikard	Low hill	635	Oby	100	.....	84	Oh	25+	75	7-51	Turbid.
8	Cen., NW, 17, 11S-31E	Raymond Holcomb	Valley	680	Oc	142	5	35	Oc	Seep	40	6-51	
								142	Olb or Or	10+			
9	NW, SE, 15, 11S-30E	Preston Osborn	Hillside	610	Oby	120	.....	120	Oc	8	90	7-51	
10	SE, SW, 2, 13S-30E	Mrs. A. B. Scott	Valley	900	Oby	252	.....	40	Oby or Oh	1½	.....	.....	
11	SW, NE, 11, 11S-29E	R. G. Curtis	Hillside	600	Olb	48	4	35	Olb	Seep	.....	.....	
12	SE, SW, 21, 11S-28E	Howard Ewing	do.	650	Oh	166	11	156	Olb	1	.....	.....	
13	SE, NE, 11, 11S-29E	Buster Greer	do.	700	Olb	68	8	67	Olb	5	28	8-51	
14	SW, NW, 18, 12S-30E	Lester Hickman	do.	1,040	Ol	100	12	30	Ocy	¼	.....	.....	
15	SE, SW, 11, 10S-29E	M. C. Woodall	do.	800	Ocy	100	70	72	Oby	Seep	65	7-52	
16	SE, NE, 9, 11S-32E	Thomas Gooch	Low hill	620	Or	100	15	65	Or	do.	.....	.....	
								96	Or or Op	do.	.....	.....	Hydrogen sulfide odor.
17	SW, SE, 16, 10S-32E	B. E. Barnett	Valley	820	Oh	120	.....	20	Oh	1/6	.....	.....	Do.
18	NW, SW, 12, 11S-27E	Cecil Cathey	do.	800	Ol	82	9	81	Ocy	8	25	9-51	
19	SW, NE, 12, 11S-29E	Clay Miller	Hillside	680	Oby	1,040	12	140	Oc*	1			
								933	O-Ck*	1½	123	10-52	Do.
20	SW, SE, 15, 11S-31E	Hershel White	do.	720	Oh	340	.....	210	Olb	Seep			
								275	Or	.....			
								300	Or	.....	60	9-51	
21	NE, NE, 1, 10S-31E	Buck Wiley	Hilltop	765	Oh	826	.....	815	O-Ck	4	.....	.....	
22	SE, SE, 23, 10S-27E	Wilse Thompson	Bluff	600	Ocy	83	26	65	Oby	10	42	3-52	
23	SE, SW, 7, 11S-31E	W. H. Matheny	Hillside	695	Oh	209	19	45	Oc	Seep	.....	.....	
24	SE, SW, 9, 10S-32E	B. A. Neil	Rolling	780	Olb	500	15	30	Olb	do.			
..								475	Om	do.	10	1-53	

* *Chemical analysis is available from the Tennessee Division of Geology.*

TABLE 25.–RECORDS OF WELLS IN MAURY COUNTY–Continued

Well No.	Location	Owner	Topographic situation	Altitude (feet)	Surface unit	Depth of well (feet)	Length of casing (feet)	Depth to water zones (feet)	Source	Yield (gallons per minute)	Depth to water level (feet)	Date of measurement	Remarks
25	NE, NW, 12, 11S-29E	R. S. Brown	Rolling	620	Oby	163	7	135	Oh or Oc	do.	40	6-52	Hydrogen sulfide odor.
26	NW, NW, 11, 11S-29E	Elbert Burgess	do.	700	Oby	200	4	110	Oh	1	70	6-52	
27	NW, NE, 21, 11S-30E	R. S. Compton	Hillside	660	Oc	350	.....	145	Olb	Seep	.....	.....	
28	SE, SE, 13, 10S-32E	Ed Dalton	Rolling	730	Olb	218	10	32	Olb	do.	.....	.....	
29	NW, NW, 12, 11S-29E	Harry Napier	do.	610	Oh	70	7	52	Oh	8	37	7-52	
30	NE, SW, 11, 11S-29E	Malcolm Lents	do.	750	Oby	41	18	35	Oh	10	23	7-52	
31	NW, NW, 17, 11S-28E	J. B. Sisk	Valley	580	Ocy	97	6	60	Oby	¾	6	7-52	Salty. Hydrogen sulfide odor.
32	SE, SW, 1, 11S-30E	T. G. Wilkins	Rolling	700	Oh	100	21	50	Oh	10	40	7-52	
33	NW, NW, 15, 11S-30E	George Williams	Low hill	600	Olb	100	11	60	Olb or Or	1			
								95	Or	10	40	7-52	
34	NE, NE, 6, 11S-29E	J. R. Baker	Rolling	700	Oby	158	27	154	Oc	10+	40	5-52	
35	NW, SW, 8, 12S-32E	N. P. Cheek	Bluff	600	Or	92	24	88	Or	8	25	7-52	
36	NE, SW, 11, 11S-29E	Will Dale	Rolling	740	Oh	142	6	134	Oc	10+	112	5-52	
37	SE, NE, 23, 10S-28E	Elmer Wise	do.	630	Oby	123	18	120	Oh or Oc	10	60	7-52	
38	SW, NW, 19, 9S-30E	M. E. Fitzgerald	do.	850	Ocy	83	.....	75	Ocy or Oby	½	48	8-52	
39	NE, NW, 15, 11S-30E	Thomas Gray	Low hill	610	Olb	100	8	43	Olb	Seep	35	7-52	
40	NE, NW, 15, 10S-31E	W. E. Hale	Valley	640	Oc	48	4	43	Oc or Olb	½	27	8-52	
41	NE, NE, 6, 10S-31E	W. T. Hardison	Rolling	660	Oh	82	.....	70	Oc or Olb	1+	47	8-52	
42	NW, NE, 6, 10S-31E	Hale Johnson	do.	660	Oh	62	.....	60	Oc	3	.....	.....	
43	NW, NE, 18, 10S-28E	G. E. Ladd	do.	600	Ocy	72	24	55	Oby*	6	35	7-52	
44	NE, SE, 3, 12S-32E	L. J. Linsley	Bluff	620	Or	102	39	96	Or or Op	10+	40	7-52	Hydrogen sulfide odor.
45	NE, NW, 12, 11S-29E	John Luster	Rolling	630	Oby	157	5	152	Oc	10+	45	7-52	
46	SE, SW, 3, 10S-29E	Lex Potts	Valley	700	Ol	60	5	30	Ocy*	1	20	8-52	
47	SE, SW, 16, 10S-33E	George Warren	Plain	700	Or	84	6	18	Or	Seep			
								80	Or	50	18	7-52	

* *Chemical analysis is available from the Tennessee Division of Geology.*



REFERENCE NO. 14

UNITED STATES DEPARTMENT OF THE INTERIOR
Harold L. Ickes, Secretary
GEOLOGICAL SURVEY
W. C. Mendenhall, Director

Water-Supply Paper 677

GROUND WATER IN SOUTH-CENTRAL TENNESSEE

BY
CHARLES V. THEIS

Prepared in cooperation with the
TENNESSEE DIVISION OF GEOLOGY

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GROUND-WATER SUPPLY IN 1930 COMPARED WITH THAT OF OTHER DROUGHT YEARS

The flow of springs and the depths to the water levels in wells, as well as other ground-water features, vary with the current and preceding climatic phenomena. The current precipitation affects the flow of springs that are connected by relatively large underground passages with open intakes, such as sink holes. The precipitation during many preceding months has also an effect on the flow of other springs, as well as on the height of water in wells, because part of the rainfall moves very slowly downward through the soil to the ground-water level, below which it is stored in the ground-water body until it is discharged. The ground-water level, or water table, usually fluctuates seasonally to some extent, rising during the winter, when more water is contributed to it by precipitation than is discharged by springs and otherwise, and falling during the summer, when the reverse is true. As the water table falls, the flow of springs diminishes. Under conditions of drought it falls much more than normally and consequently the springs discharge much less than their normal flows for the season. Temperature has also both immediate and delayed effects, for it controls in part the rate of transpiration of plants and the rate of evaporation, so that in hot, dry weather much of the ground water is removed by these agencies. Furthermore, when soils have been drying for a long time, much of any rainfall that comes is absorbed by the soil near the surface and never descends to the zone of saturation.

The summer of 1930, in which the field work for this report was done, was characterized by a severe drought throughout the area studied, as well as generally in the central and eastern United States. Although streams in the Tennessee Valley in general did not decline as much in this year as they had in 1925,[12] or in 1931, the flows were reduced in general to much less than normal. The ground-water flow probably did not decrease in as great a ratio as the flow of the surface streams, yet undoubtedly the flows given in this report for many springs are less than normal, and the water levels in wells are probably also lower than their average position.

The exact effect of the climatic conditions upon the ground-water phenomena observed during the summer and fall of 1930 cannot be evaluated from the data collected during one field season. To do so would require an intensive study, during at least several years, of the relations between climatic factors, ground-water levels, and the flow of springs. However, the accompanying tables are given to indicate qualitatively rather than to define exactly the relation of the data acquired during 1930 to data that might have been

[12] King, W. R., Surface waters of Tennessee: Tennessee Div. Geology Bull. 40, p. 50, 1931.

water companies in the area, to local geologists, and to the inhabitants in general, the writer is indebted for courteous and intelligent cooperation.

The published work of many other geologists has been used in preparing this report. Although the papers used are cited in the text, it is not out of place to note here that the section on stratigraphy is based largely on the work of Bassler,[5] Butts,[6] Miser,[7] Wade,[8] and Dunbar.[9]

The region under discussion has an area of 6,108 square miles and includes the counties of Bedford, Franklin, Giles, Hickman, Lawrence, Lewis, Lincoln, Marshall, Maury, Moore, Perry, and Wayne. It lies almost entirely within the basin of the Tennessee River and extends from that river, on the west, to the Cumberland Plateau, on the east. It is bounded on the south by the Alabama State line and extends north about to the middle latitude of the State. It is served by numerous highways and by the Louisville & Nashville Railroad and the Nashville, Chattanooga & St. Louis Railway. It is predominantly agricultural in interest, although Maury County and to a less extent Lewis County produce phosphate rock, and Wayne, Lewis, and Hickman Counties have produced brown iron ore up to the last few years and still have large reserves.

CLIMATE

GENERAL FEATURES

South-central Tennessee lies between two of the main storm tracks crossing the eastern United States but not directly upon any.[10] Hence there are many comparatively gentle changes in the weather but relatively few severe ones. Its position with reference to the storm tracks conduces to a generally favorable distribution of rainfall throughout the year and a minimum of destructive storms. Isopluvial charts show that the greatest storms in this general area are less in intensity than in any other area in the same latitude in the eastern United States.[11]

[5] Bassler, R. S., The stratigraphy of the Central Basin of Tennessee: Tennessee Div. Geology Bull. 38, 1932.

[6] Butts, Charles, Geology of Alabama; the Paleozoic rocks: Alabama Geol. Survey Special Rept. 14, 1926.

[7] Miser, H. D., Mineral resources of the Waynesboro quadrangle: Tennessee Geol. Survey Bull. 26, 1921.

[8] Wade, Bruce, The geology of Perry County and vicinity: Resources of Tennessee, vol. 4, no. 4, Tennessee Geol. Survey, 1914.

[9] Dunbar, C. O., Stratigraphy and correlation of the Devonian of western Tennessee: Tennessee Geol. Survey Bull. 21, 1919.

[10] Summary of the climatological data for the United States, Section 77, Middle and west Tennessee, U. S. Weather Bureau.

[11] Storm rainfall of eastern United States: Miami Conservancy District Tech. Repts., pt. 5, Dayton, Ohio, 1917.

TEMPERATURE

The mean annual temperature of central Tennessee, as well as for stations within the area of this report, is 58.7° Fahrenheit. For individual stations it ranges from 59.7° at Coldwater, Lincoln County, to 58.4° at Franklin, Williamson County, just north of the Maury County line, and 57.2° at Sewanee, Franklin County. These figures indicate a general decrease toward the north and also with increasing altitude above sea level. Maximum temperatures of 110° were reached in the summer of 1930, but as a rule the temperature does not exceed 95° more than about 15 days a year. Minimum temperatures as low as 25° below zero have occurred, but on the average temperatures below zero occur only once a year. July is the hottest month and January the coldest. The average date of the last killing frost in spring is April 6, and of the first in autumn October 24.

Mean monthly temperatures for central Tennessee, as computed from records up to and including 1930, are shown in the following table:

Mean monthly temperatures (°F.) for central Tennessee

January	39.2	May	66.7	September	71.4
February	40.7	June	74.7	October	59.8
March	49.9	July	77.4	November	48.6
April	58.6	August	76.6	December	40.6

PRECIPITATION

The mean annual precipitation for all of Tennessee is about 50 inches and that for central Tennessee is about 51 inches. The figure for the stations in and adjacent to the south-central Tennessee area is about 52.5 inches. The highest mean, as computed from records up to and including 1930, is found at Sewanee, Franklin County, with 54.76 inches, and the lowest at Franklin, Williamson County, with 48.54 inches. The rainfall diminishes slightly northward and increases slightly with altitude.

The rainfall is well distributed throughout the year, reaching a minimum in October with 3.01 inches, and a maximum in March with 5.65 inches. A quantity sufficient for crop needs generally falls during the growing season, and a copious supply is also available during the winter, when recharge of ground water is most favored. The following table gives the mean monthly precipitation in central Tennessee.

Mean monthly precipitation (inches) for central Tennessee

January	5.00	May	4.26	September	3.18
February	4.21	June	4.31	October	3.01
March	5.65	July	4.58	November	3.47
April	4.68	August	4.18	December	4.65

Analyses of ground waters from Marshall County

[No. 329 analyzed by Margaret D. Foster, U. S. Geological Survey; the rest by D. F. Farrar, Tennessee Geological Survey. Parts per million. Numbers at heads of columns correspond to numbers in tables of well and spring data]

	322	326	329	342	Lewisburg [a]
Silica (SiO_2)	9.8	12	11	10	6.8
Iron (Fe)	1.4	2.1	.09	.85	.84
Calcium (Ca)	85	122	3.2	32	34
Magnesium (Mg)	10	16	1.5	4.0	2.0
Sodium (Na)	5.0	17	233	3.3	3.4
Potassium (K)	1.0	4.0	5.6		
Carbonate (CO_3)	0	0	57	0	0
Bicarbonate (HCO_3)	292	294	420	100	101
Sulphate (SO_4)	5.3	108	67	12	11
Chloride (Cl)	8.5	32	18	5.5	5.5
Nitrate (NO_3)	.67	1.3	1.3	.15	.60
Total dissolved solids	[b] 270	470	609	121	115
Total hardness as $CaCO_3$ (calculated)	254	370	14	96	97
Date of collection (1930)	Oct. 30	Oct. 31	[c]	Nov. 5	Nov. 6

[a] Municipal water supply at Lewisburg; sample taken from private tap; impounded surface water.
[b] Calculated.
[c] Sample analyzed July 1931.

MAURY COUNTY

[Area 582 square miles, population 34,016]

Maury County lies in the north-central part of the area discussed in this report. It is bounded on the north by Williamson County, on the east by Marshall County, on the south by Giles and Lawrence Counties, and on the west by Lewis and Hickman Counties. The largest city is the county seat, Columbia, with a population of 7,882. Mount Pleasant (population 2,010), in the southwest corner, is the center of a large phosphate industry.

The Duck River flows northwestward through the middle of the county and drains the entire area.

The Louisville & Nashville Railroad connects the centrally located city of Columbia with Nashville, to the northeast, with Pulaski, to the south, and with Mount Pleasant and Lawrenceburg, to the southwest. The Nashville, Chattanooga & St. Louis Railway connects Columbia with Lewisburg, to the southeast. Paved highways radiate from Columbia approximately along the lines of the Louisville & Nashville Railroad, and graveled highways connect Columbia with Lewisburg and Centerville.

The county is predominantly rural in character. The phosphate industry centered about Mount Pleasant and near Williamsport is the largest basic industry, aside from agriculture, in south-central Tennessee.

GEOLOGY

Maury County is a part of the Nashville Basin, although spurs from the Highland Rim plateau project into it from the northwest, west, and southwest, and remnants of the rim are found in all but the most eastern portion. The plateau in the southwest corner lies 1,000 feet above sea level, and the Duck River leaves the county at about 500

feet, making the total relief 500 feet. The Highland Rim spurs are greatly dissected, and this portion of the county is topographically very rough. Throughout that part of the lowland lying west of Columbia the topography is rolling, but in the eastern part of the county the local relief is very small, and much of the area has the typical glade character.

Most of the high parts of the Highland Rim spurs, except along the Giles County line, are capped by the St. Louis limestone and the Warsaw formation. The maximum combined thickness of these formations in this county is probably close to 100 feet. Underneath these, making the steep slopes of the hills, are the Fort Payne chert and Ridgetop shale, reaching a maximum combined thickness of 250 feet. The Maury glauconitic member is generally present at the base of the Ridgetop shale. The Chattanooga shale crops out in the hillsides and is 10 feet or less thick. The Silurian is present in small areas in the western part of the county. It consists of shaly limestone and is thin in this area. The uppermost Ordovician, the Fernvale formation, also crops out in the western part of the county. Here it consists of light-colored shale and reddish crystalline limestone. It, too, is thin. The nodular shaly Leipers limestone is present on the lower hill slopes in the western part of the county and overlies the similar Catheys limestone. The combined thickness of these two formations ranges from a knife-edge to 200 feet.

Stratigraphically below the Catheys limestone comes the Cannon limestone. This formation is present only in the eastern part of the county, never having been deposited in the western part, in the Columbia quadrangle.[51] The Cannon limestone consists of dove-colored semilithographic limestone and argillaceous limestone and shale.

Stratigraphically, the Bigby limestone underlies the Cannon limestone, but it is best developed in the western part of the county, where the Cannon is absent, and pinches out in the eastern part of the county, where the Cannon is well developed. It has a maximum thickness of about 100 feet and is predominantly a semi-oolitic or granular crystalline laminated and locally cross-bedded limestone. Its type area is on Bigby Creek, in this county, and, in its typical facies at least, it does not extend far beyond the limits of the county except to the south in Giles County. Below the Bigby limestone is the Hermitage formation, a shaly limestone from 40 to 70 feet thick.

The Hermitage formation is underlain by the Lowville limestone, consisting in most of the county of the lower or Carters limestone member, typically a thick-bedded limestone, weathering into a red soil through which unweathered limestone bosses project. Its thickness is almost 50 feet. In the eastern part of the county the

[51] Bassler, R. S., op. cit., p. 86.

thinner-bedded upper limestone member wedges in between the Carters member and the overlying Hermitage formation according to Bassler.

The thin-bedded dove-colored and gray Lebanon limestone comes in below the Carters limestone and is widely exposed from Columbia eastward. The following sections, adapted from Bassler,[52] illustrate the rapid eastward change in stratigraphy:

Stratigraphic section at Columbia

[Lowville and Lebanon exposed in banks of Duck River, Hermitage, and Bigby from Santa Fe pike southwest to West 7th and Armstrong Streets, remainder from that point to top of Mount Parnassus]

	Feet
Leipers limestone:	
Thin-bedded nodular blue limestone with intercalated blue and yellow shale crowded with Bryozoa and other fossils	15
Mostly covered, but limestone similar to underlying bed with upper layer granular, gray, and cavernous	28
Impure thin-bedded limestone with few fossils except in top layer, which is full of broken shells and Bryozoa	12
Shaly impure limestone in thin layers, crowded with *Rafinesquina alternata* and *Platystrophia ponderosa*	6
Catheys limestone:	
Rough-bedded dark thin argillaceous limestone weathering cavernous (small holes); fossils few and indeterminable	14
Fossiliferous shaly limestone crowded with the massive bryozoan *Cyphotrypa tabulosa*	4
Unevenly bedded granular and subgranular blue limestone; upper part contains *Escharopora falciformis* var	16
Blue massive subcrystalline limestone with *Cyclonema varicosum*	4
Thick-bedded fine-grained gray or blue clayey limestone with numerous gastropods and pelecypods—*Lophospira bowdeni*, *Orthorhynchula linneyi*, *Tetradium columnare*, and small *Stromatocerium pustulosum*	4
Shaly nodular and subcrystalline limestone, crowded with Bryozoa, especially *Escharopora flabellarius*, *Heterotrypa parvulipora*, and *Homotrypa centralis*	16
Granular and crinoidal limestone with abundant *Solenopora compacta* from 1 to 2 inches in diameter	5
Nodular blue clayey limestone with two layers (one at base and other above the middle) with abundant large *Stromatocerium pustulosum*. Many other fossils	18
Finely granular laminated unfossiliferous phosphatic limestone	6
Phosphatic limestone in thin beds; top layer covered with *Constellaria grandis* and other Bryozoa	6
Blue granular limestone crowded with *Constellaria teres* and *C. emaciata*	2

[52] Bassler, R. S., op. cit., pp. 28-29, 31-32.

Stratigraphic section at Columbia—Continued

	Feet
Catheys limestone—Continued.	
Blue to yellow shale with *C. teres*, *C. emaciata*, and other Bryozoa	4
Shaly limestone with few fossils	2
Bigby limestone:	
Gray to blue granular limestone crowded with *Rafinesquina*	1
Granular limestone with a few *Rafinesquina* and other fossils; hemispheric Bryozoa and *Eridotrypa briareus* at base	5
Granular gray-blue limestone with *Rafinesquina*	2
Subgranular unfossiliferous limestone	2
Gray granular limestone with *Rafinesquina* and several layers with *Ctenodonta subrotunda*, *Bellerophon clausus* var., *Lophospira*, *Rhynchotrema increbescens*, large *Dalmanella*, and *Hebertella frankfortensis*	5
Unfossiliferous shale	1
Thin-bedded subgranular gray limestone, yielding a little chert on weathering, with abundant *Rafinesquina*, rare *Dalmanella*, and cyclorid gastropods	17
Hermitage formation:	
Blue even-bedded subcrystalline limestone with abundant *Dalmanella fertilis*	50
Impure blue clayey limestone, fine-grained in upper half; *Dalmanella fertilis* rare, *Prasopora patera* common	15
Lowville limestone (Carters limestone member):	
Massive magnesian limestone, easily recognized by white color of its outcrop	12
Mottled thick-bedded magnesian limestone, locally with *Maclurea bigsbyi*, *Stromatocerium rugosum*, *Columnaria halli*, *Lophospira*, *bicincta*, and *Dystactospongia minor*	18
Single bed of mottled fine-grained dove-colored, nearly pure limestone with yellow magnesian spots; locally fossiliferous	4
Massive fine-grained mottled, rather pure dove-colored limestone with fossils weathering out siliceous, particularly *Streptelasma profundum*, *Columnaria halli*, *Stromatocerium rugosum*, and *Maclurea bigsbyi*	6
Mottled yellow massive limestone, low in magnesia; no fossils seen	3
Massive finely granular yellow, nearly pure limestone with *Stromatocerium rugosum*, *Columnaria halli*, *Tetradium columnare*, *T. carterensis*, and *Lichenaria carterensis*	5
Fine-grained yellow limestone; no fossils	1½
Lebanon limestone: Thin-bedded dove-colored limestone, in some places separated by shaly layers.	

Stratigraphic section on Bear Creek Pike, on west side of Loftus Hill, 8 miles east of Columbia

	Feet
Chattanooga shale	5
Leipers limestone:	
Nodular earthy calcareous shale with *Platystrophia ponderosa*	13
Shaly blue limestone crowded with Bryozoa	4½
Impure limestone with large *Platystrophia ponderosa* and *Strophomena planoconvexa*	7
Shaly limestone, not well shown, full of *Tetradium fibratum*, *Platystrophia ponderosa*, and Mollusca	7
Gray-blue limestone; no recognizable fossils	10
Blue limestone with *Bucania*, *Hebertalla sinuata*, and *Platystrophia ponderosa*	8
Catheys limestone:	
Shaly limestone with Bryozoa	2
Laminated granular limestone	4
Argillaceous limestone and shale with *Columnaria alveolata*, *Stromatocerium pustulosum* and *Tetradium fibratum*	4
Laminated granular limestone	4½
Gray subcrystalline limestone	3
Shale and clayey limestone, weathering cherty at top; *Stromatocerium pustulosum*, *Tetradium fibratum*, and *Columnaria alveolata* abundant in weathered debris	5½
Blue subcrystalline limestone and shale, full of Bryozoa, especially *Constellaria emaciata* and *C. teres*	4
Cannon limestone:	
Laminated granocrystalline limestone weathering into thin platy phosphate	10
White and gray oolitic limestone, with fossils, particularly the gastropods *Lophospira sumnerensis*, *Bucania*, *Oxydiscus*	10
Granocrystalline phosphatic limestone	9
Dove-colored limestone	8
Bigby limestone: Gray subcrystalline limestone	2

Maury County lies on the west side of the Nashville dome. The general dip of the rocks is a little north of west, the amount about 250 feet in the 25 miles across the county. There are local folds throughout the county, and some minor faulting has occurred. Between Columbia and Williamsport an area of about 1 square mile represents a graben in which the Fort Payne chert is brought into contact with the Hermitage formation, giving a maximum displacement of about 400 feet. A fault with the northern area downthrown about 50 feet runs eastward for several miles south of Santa Fe.

GROUND WATER

Ground water as found in Maury County conforms to the same generalizations found valid in the other basin counties. Shallow wells furnishing adequate supplies for domestic use are successfully drilled in most places in the county. In a few places, however, even a domestic supply is hard to obtain. In the vicinity of Match seven holes close together, the deepest 308 feet deep, failed to obtain any water. Deep wells in search of large supplies are sometimes successful and sometimes not. A well at the site of the old ice plant at Columbia (well 368) is reported to have yielded about 75 gallons a minute, probably from the Murfreesboro limestone. At the site of the present ice plant in Columbia six holes from 300 to 500 feet deep and one hole 1,105 feet deep (well 367) failed to strike any water, except a seep estimated at 1 gallon an hour. The deepest well should have passed through the horizon of the St. Peter sandstone, which yields water elsewhere in the basin. At the Arrow phosphate plant, near Mount Pleasant, well 360, about 700 feet deep, is reported to have furnished a continuous supply of about 300 gallons a minute. The water was obtained near the bottom of the well. This well has been abandoned because it did not satisfy the needs of the plant. Well 356 and a nearby well at the Armour Fertilizer Co.'s plant near Williamsport, both 155 feet deep, draw from 30,000 to 40,000 gallons a day from the Carters limestone at a depth of about 150 feet.

On the spurs of the Highland Rim water for domestic purposes is obtained from the weathered residue of the Mississippian limestones.

Springs are present throughout the county and vary in yield with the relief of the adjacent county. The largest spring seen is no. 390, near Southport. It issues from the Hermitage formation and was flowing about 400 gallons a minute when visited in July 1930.

The public water supply at Columbia is obtained from the Duck River. Carpenter and Kidd Springs, in Lewis County (nos. 262 and 263, p. 130) furnish the water supply of Mount Pleasant.

Records of wells in Maury County

[Nos. 353–355, 357, 380 dug; all others drilled]

No. on pl. 1	Location with respect to nearest map point	Owner or lessee	Topographic situation	Approximate altitude (feet)	Depth (feet)	Diameter (inches)
*348	Santa Fe, 3 miles north	Will Stanfield	Ridge	880	80	5
349	Santa Fe, 4 miles north	Mrs. Maggie Wakefield	Creek terrace	715	80	----------
350	Theta	G. W. Barnes	Ridge	945	28	6
351	Santa Fe	J. R. Dodson	Valley	670	20	6
352	Santa Fe, 2½ miles southeast	R. Y. McKee	Ridge	925	62	6
353	Williamsport	James R. Walker	Terrace remnant	625	35	----------
354	do	Dr. H. O. Anderson	do	630	35	48
355	Williamsport, 4 miles southeast	Nick Farris	Small valley	795	24	42±
356	Williamsport, 5 miles southeast	Armour Fertilizer Co	Rolling	700	155	6
357	Hampshire, 5½ miles northwest	Herbert Farris	Ridge	880	62	----------
358	Hampshire, 1½ miles west	R. M. Patton	Hillside	700	46	6
359	Hampshire, 2 miles northeast	W. S. Parkes	Valley	600	37	8
360	Mount Pleasant, 1½ miles southeast	Arrow Mines Co	do	700	700±	10
361	Mount Pleasant	Mount Pleasant Ice Co	do	630	110	8
362	Mount Pleasant, 1½ miles north	L. & N. R. R	do	635	60	----------
*363	Mount Pleasant, 6 miles southeast	E. J. Gilbreath	Gentle hillside	720	85	6
*364	Columbia, 3½ miles southwest	W. J. Sheegog	do	690	70	6
365	Hampshire, 5 miles northeast	Geo. P. Webster	Low hill	590	51	5
366	Columbia, 4 miles southwest	John M. Gray	do	675	100	6
367	Columbia	Columbia Ice & Cold Storage Co	Plain	655	1,105	14
368	do	do	River terrace	600	300	6
369	Columbia, 5½ miles northwest	J. K. P. Timmons Estate	Base of hill	585	26	8
370	Carters Creek, 3 miles north	L. Sparkman	Plain	700	32	6
*371	Carters Creek, 1 mile east	John Armistead	Open valley	610	29	36
*372	Spring Hill, 4 miles southeast	W. M. Parham	Low hill	690	73	5
373	Match, 6 miles northeast	J. A. Crow	Gentle hillside	670	26	5
*374	Match, 5 miles east	H. T. Chunn	Low hill	660	75	6
375	Match, 1 mile east	W. A. Harbison	Low ridge	740	308	5
376	Match	E. D. Minor	Hillside	825	66	6
377	Match, 3 miles south	Mrs. M. L. Barber	Low spur	725	40	6
378	Culleoka, 4 miles north	S. A. Sims	Terrace	580	83	5½
379	do	F. M. Landres	Low hill	610	116	5½
380	Silver Creek, 3 miles north	G. W. Tindell	Level	650	25	30
381	Silver Creek, 1 mile west	Dr. W. R. Orr	Base of hill	690	24	5
382	do	do	Hillside	720	1½	5
*383	Silver Creek, 2 miles west	W. E. Cheek	do	730	115	5
384	Culleoka	Hobbs Bros	do	705	100	6

* Analysis given in table of analyses.

Records of wells in Maury County—Continued

No. on pl. 1	Water-bearing beds			Water level		Use of water	Total hardness as $CaCO_3$ (parts per million)[b]	Remarks
	Depth (feet)	Lithologic character	Stratigraphic position	Above or below surface (feet)	Date of measurement (1930)			
348	80±	Chert	Fort Payne chert	−71	July 17	Domestic		
349	30±	Shaly limestone	Leipers limestone	−19	do	do		
350	28±	(?)	St. Louis limestone	−23	do	do		
351	20±	Limestone	Bigby limestone	−15	July 16	do		
352	62±	Chert	Fort Payne chert	−54	July 17	do		
353		Limestone	Bigby limestone			do		Wells in Williamsport generally dug through about 20 feet of alluvial gravel and silt into bedrock below.
354	29±	do	do	−29	July 16	do		
355		Residual chert (?)	Fort Payne chert			do		
356	150±	Limestone	Lowville limestone	−10		Domestic; boiler		Water reported hard. This and another well close by and of same depth furnish 30,000 to 40,000 gallons a day.
357	58±	Residual chert (?)	Fort Payne chert (?)	−58	July 18	Domestic; stock		
358	46±	Shaly limestone	Catheys limestone	−41.5	July 10	do		
359	37±	do	do		July 10	do		
360	700±	Limestone		−20		Well abandoned		Reported to have produced at rate of 300 gallons a minute continuously. Abandoned because supply inadequate for needs. Sulphur water.
361	110±	do	Lowville limestone	−5½		Cooling		
362	60±	(?)	Hermitage formation	−30		Domestic		Reported ample for 4 families.
363	70	Limestone	Lebanon limestone (?)	−50		Stock		Sulphur water.
364	70±	do	Hermitage formation	−35		Domestic; stock		
365	51±	do	Bigby limestone	−38	July 18	Domestic		
366	97	do	Lowville limestone	−50±		Domestic; stock		
367				−40		None		Only water found was a seep, estimated at 1 gallon an hour, from 600-foot depth. Six other wells 300 to 500 feet deep obtained no water.
368	300±	Limestone	Stones River group			Cooling		Abandoned well at former location of ice plant on northwest edge of town. Reported to have yielded 75 gallons a minute.
369	26±		Hermitage formation	−15.5	July 17	Domestic		
370	32±	Limestone	do	−14	July 19	do		
371	28±	do	do	−28	do	do		Water low and unfit for use on July 19.
372	73±	do	Lebanon limestone	−1.8	Oct. 14	Domestic; stock	500	
373	26±	do	do	−14		do	270	

374	75±	do	do. (?)	−67	Oct. 14	Medicinal		Water contains H_2S and is salty.
375								Deepest of 7 holes drilled within radius of 500 feet without obtaining water. Formations passed through were Lebanon, Ridley, and Pierce.
376	66±		Catheys limestone	−53	Oct. 15	Domestic; stock	815	
377	40±	Limestone	Lowville limestone (?)	−81.8	do	do	440	
378	83±	do	Lebanon limestone (?)	−29.0	Oct. 16	Domestic	445	
379	116±	do	do	−42	do	Domestic; stock	345	
380	24±	do	Lebanon limestone	−24.2	Oct. 15	do	310	
381	24±	do	do	−18.9	do	do	155	
382		do	do	0	do	Stock	500±	Drill hole in abandoned quarry.
383	115±	do	do	−104	Oct. 16	Domestic		
384	100±	do	Lebanon limestone	−20		do		

[a] Determined in field with standard soap solution.

Records of springs in Maury County

No. on pl. 1	Location with respect to nearest map point	Owner or lessee	Topographic situation	Approximate altitude (feet)	Kind of rock	Stratigraphic position
[b]385	Thota	Oscar Peach	Small valley	925	Limestone	St. Louis limestone.
386	Santa Fe, 2 miles northeast	Charles Harris	Base of hill	680	do	Leipers limestone.
387	Santa Fe, 3 miles west	Village of Water Valley	Hillside	720	Shaly limestone	Do.
388	Mount Pleasant	Mount Pleasant Ice Co	Base of hill	830	Limestone	Hermitage formation.
389	Mount Pleasant, 5 miles southeast	Bob Benderman	do	780	do	Bigby limestone.
390	Culleoka, 6 miles west	Stella Horn	do	750	do	Hermitage formation.
391	Culleoka, 5 miles southwest	Mrs. V. A. Richardson	do	845	do	Bigby limestone.
[b]392	Culleoka, 6 miles northwest	Moore & McLean	Creek	675	do	Lowville limestone.
[b]393	Columbia, 2 miles northeast	Dr. O. J. Porter	do	625	do	Do.
394	Columbia, 3½ miles west	Dr. W. K. Sheddan	Head of drain	750	do	Hermitage formation.
395	Columbia, 4 miles southwest	John M. Gray	Branch	650	do	Do.
396	Columbia	Columbia Ice & Cold Storage Co	Bluff at edge of flood plain.	550	do	Lowville limestone.
397	Columbia, 2½ miles north	Public	Base of hill	660	do	Do.
[b]398	Spring Hill	Branham & Hughes	do	680	do	Bigby limestone.
399	Match, 2 miles east	W. A. Hardison	Valley	690	do	Lebanon limestone.
400	Culleoka, 2 miles south	T. M. Hobbs	Base of hill	705	do	Lowville limestone.

[b] Analysis given in table of analyses.

Records of springs in Maury County—Continued

No. on pl. 1	Openings		Approximate yield		Use of water	Total hardness as $CaCO_3$ (parts per million)[1]	Remarks
	Number	Character	Gallons a minute	Date of measurement (1930)			
385	1	Enlarged bedding plane	3±	July 17	Domestic; stock		
386	1	Bedding plane	1	do	Domestic		
387	1	Joint crack (?)	10±	July 16	Domestic; stock		Furnishes water to about 12 houses in village ¼ mile west.
388	1	Enlarged bedding plane	3±	July 11	Cooling		
389	1	Solution channel	12	Oct. 17	Domestic; stock	180	
390	1	do	400	July 15	do		Galloway Spring.
391	1	Enlarged bedding plane	8	do	do		
392	1	Enlarged joint plane	5±	do	do		Bigby Spring. Reported to have stopped flowing after each of several rains. Discussed on p. 40.
393	1			July 9	Medicinal		
394	1	Enlarged bedding plane	1	do	do		
395	1	do	1	July 14	Stock		
396	1	Solution channel	75±:	July 9	Domestic		White Spring. Evidence of contamination at several points.
397	1	Enlarged joint crack	5±	July 17	Abandoned		
398	2	Enlarged bedding plane			Public supply		Except in summer supplies town. Supplemented by well in summer.
399	1	Concealed	2½±	Oct. 14	Domestic; stock	245	
400	2	Solution channel	75	Oct. 16	do	140	

[1] Determined in field with standard soap solution.

Analyses of ground waters from Maury County

[Nos. 372 and 374 analyzed by D. F. Farrar, Tennessee Geological Survey; the rest by Margaret D. Foster, U. S. Geological Survey. Parts per million. Numbers at heads of columns correspond to numbers in tables of well and spring data]

	348	355	363	364	371	372	374
Silica (SiO_2)	10	7.9	8.8	8.3	12	14	14
Iron (Fe)	.07	.17	.09	.06	.08	1.2	1.8
Calcium (Ca)	25	33	46	98	64	235	848
Magnesium (Mg)	4.2	4.9	30	5.2	3.8	27	52
Sodium (Na)	1.8	9.9	13	2.3	1.7	10	35
Potassium (K)	1.0	5.6	6.4	1.7	.7	3.0	4.1
Carbonate (CO_3)	0	0	0	0	0	0	0
Bicarbonate (HCO_3)	91	48	258	286	200	329	414
Sulphate (SO_4)	3.3	59	54	12	4.0	400	1,881
Chloride (Cl)	1.8	10	1.8	2.7	1.8	18	60
Nitrate (NO_3)	2.3	16	3.6	30	3.5	.60	.80
Total dissolved solids	95	177	290	311	200	955	3,283
Total hardness as $CaCO_3$ (calculated)	80	103	238	266	176	897	2,324
Date of collection (1930)	July 17	July 16	July 15	July 15	July 16	Oct. 14	Nov. 8

	385	392	393	398	Duck River [a]	Duck River [b]
Silica (SiO_2)	9.5	16	12	12	4.1	11
Iron (Fe)	.04	.06	.05	.04	.04	.04
Calcium (Ca)	12	86	38	69	38	40
Magnesium (Mg)	5.4	9.5	23	5.8	4.6	4.1
Sodium (Na)	1.8	2.3	58	5.0	2.3	1.7
Potassium (K)	1.0	1.3	4.3	1.3	.9	1.0
Carbonate (CO_3)	0	0	0	0	0	0
Bicarbonate (HCO_3)	46	283	254	164	129	124
Sulphate (SO_4)	2.8	13	75	28	6.6	16
Chloride (Cl)	2.3	2.4	21	8.0	1.7	1.6
Nitrate (NO_3)	13	10	.75	36	1.3	.46
Total dissolved solids	74	284	349	249	124	138
Total hardness as $CaCO_3$ (calculated)	52	254	189	196	114	117
Date of collection (1930)	July 17	July 15	July 9	July 19	July 9	July 9

[a] Duck River at Columbia; sample taken just above dam of Tennessee Electric Power Co.; river at low stage.

[b] Duck River at Columbia; municipal water supply; sampled at clear well after sedimentation, alum treatment, and filtration.

MOORE COUNTY

[Area, 141 square miles; population, 4,037]

Moore County, the smallest county in the area of this report, is on the eastern border of the area, wedged in between Bedford, Coffee, Franklin, and Lincoln Counties. The county seat is Lynchburg (population 380).

Practically the entire area of the county is drained by a few small tributaries of the Elk River. The Duck River divide lies just about on its northern boundary.

No railroad enters the county. One hard-surfaced highway connects Lynchburg with the Shelbyville-Winchester highway, which passes through the northeastern part of the county. Others to Winchester and Fayetteville are under construction (1930).

Agriculture is the only industry. Large distilleries formerly operated in the county.

131880—36——11

REFERENCE NO. 15

Treatment plant/O,Y
Services

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS IN SELECTED AREAS OF TENNESSEE

EXPLANATION OF COLUMN HEADINGS

QUAD/NTH = Designation by number, Quadrant and ninth of the 15 - minute quadrangle area in which the well is located. The leading numbers identify the 15-minute quadrangle, the next two letters identify the 7.5-minute quadrant and the last digit identifies the one-ninth subdivision of the latter.

COUNTY = County in which the well is located.

WELL NUM = Identification number assigned to the well by the State.

TAG NUM = An inspection number assigned to the well at the time of inspection by the State.

OWNER'S NAME = Name of person or organization for whom the well was drilled.

LOCATION ROAD = Name of street or road from which to access the well. Blank if unknown.

COMP DATE = Month, day and year the well was completed.

INSPT DATE = Month, day and year the well was inspected by TDHE. Blank if well has not been inspected.

TOT DEPTH = Total depth of the well in feet.

AQ DEPTH = Depth, in feet, below land surface to the top of the shallowest aquifer or water-bearing zone tapped by the well.

TOT YIELD = Total yield of the well in gallons per minute (gpm). Yields less than one-half gpm reported as zero.

STAT LEVEL = Static water-level: depth, in feet, from the land surface to the surface of the water standing in an idle well.

CSE DEPTH = Casing depth: depth, in feet, to the bottom of the water tight casing installed in the well.

CSE TYPE = Casing type: PLAST = Plastic; STEEL = Steel; OTHER = any other material such as concrete, fiberglass or tile.

WELL FINISH = Construction of the well in the interval supplying water to the well: OPEN = Uncased or open hole; SLOT = Hand perforated or slotted pipe; SCREEN = Manufactured device designed to maintain the wall of the borehole and allow ground water to enter the well.

INTERVAL = The depth, in feet, from the top to the bottom of the interval that is open to the well.

WAT QUAL = Water Quality: a word to describe the relative quality of the well water such as GOOD, FAIR, BAD, LIME, IRON, SULFUR, SALT, OIL, GAS, OTHER.

GEO FORM = Name of the geologic formation tapped by the well (not generally reported).

LATITUDE = Latitude of well site in degrees, minutes, and seconds.

LONGITUDE = Longitude of well site in degrees, minutes, and seconds.

A/C = Accuracy Code for latitude and longitude: S = Nearest second; F = nearest 15 seconds; T = nearest 30 seconds; M = nearest minute; Blank = nearest 2.5 minutes.

LOG = Refers to availability of drillers log: Y = yes; N = no.

DRILLER = License number of driller who supervised construction of the well. Names provided upon request.

USE = Purpose for which the well was constructed: HOME = residential; COMM = commercial; etc.

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE QUADRANGLE (0057NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0057NE MAURY	11900686	MILES W	06/14/1973 / /	802 775	2 --	21 STEEL	-- - --	GOOD	- - - -		00120 HOME
0057NE MAURY	11900723	KNOLTON L.	08/22/1973 / /	1175 1125	3 21	23 STEEL	-- - --		- - - -		00120 HOME
0057NE MAURY	11900822	DALE P.	07/16/1975 / /	1275 1240	3 196	28 STEEL	-- - --	GOOD	- - - -		00120 HOME
0057NE MAURY	11909190	KERNIE COTHRAN	01/03/1967 / /	1022 1010	3 146	--	-- - --		- - - -		00120
0057NE MAURY	11909193	OSCAR DAMRON	04/28/1965 / /	1096 1017	1 235	--	-- - --	GOOD	- - - -		00120
0057NE MAURY	11909195	JAY DEMASTUS	05/02/1975 / /	1117 1050	4 84	--	-- - --	GOOD	- - - -		00120
0057NE MAURY	11909219	EARL ERWIN NO-1	09/18/1959 / /	1047 1047	5 68	--	-- - --	GOOD	- - - -		00416
0057NE MAURY	11909220	EARL ERWIN NO-2	06/28/1963 / /	1054 1030	3 148	--	-- - --	GOOD	- - - -		00416
0057NE MAURY	11909241	CARLICE LOVELL	06/23/1972 / /	1085 1025	-- 130	--	-- - --		- - - -		00120
0057NE MAURY	11909256	CORLICE LOVELL	06/23/1972 / /	1085 1025	-- 130	--	-- - --		- - - -		00120
0057NE MAURY	11909266	JAMES H.REESE NO-2	09/29/1966 / /	883 865	3 63	--	-- - --	GOOD	- - - -		00252
0057NE MAURY	11909291	B.H WALTERS	04/05/1961 / /	905 900	6 40	--	-- - --	GOOD	- - - -		00120
0057NE MAURY	11909293	STANLEY WILLIAMS	11/02/1962 / /	917 917	10 62	--	-- - --	BAD	- - - -		00120
0057NE 1 MAURY	11900059	GOOD F	06/06/1964 / /	80 55	5 35	11 STEEL	-- - --	BAD	35-44-34 87-06-14	S	00058 HOME
0057NE 1 MAURY	11900090	WOODY J	07/07/1964 / /	96 70	20 30	58 STEEL	-- - --	GOOD	35-43-50 87-07-20	S	00120 HOME
0057NE 1 MAURY	11900161	LOCKHART J	05/13/1965 /	100 65	10 40	6 STEEL	-- - -	GOOD	35-43-04 87-07-17	S	00252 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GODWIN QUADRANGLE (0057NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0057NE 1	11900431	POTTS R	01/10/1968	120	1	25		GOOD	35-43-13	S	00120
MAURY			/ /	50	--	STEEL	-- - --		87-07-27		HOME
0057NE 1	11901276	BEATTY_____ CHAR	03/14/1989	100	12	20	OPEN	GOOD	- -		00640
MAURY		ARTHUR HUTCHISO	/ /	84	50	OTHER	20 - 100		- -	Y	HOME
0057NE 1	11901282	CONNLEY_____JACK	04/24/1989	175	0	51		OTHR	- -		00640
MAURY		TAYLOR	/ /	--	--	OTHER	-- - --		- -	Y	HOME
0057NE 1	11901283	CONALLEY_____JACK	05/08/1989	125	5	84	OPEN	GOOD	- -		00640
MAURY		TAYLOR	/ /	85	72	OTHER	96 - 125		- -	Y	HOME
0057NE 1	94000158	GASKELL_____BOBB	01/03/1994	340	--	--		OTHR	- -		00227
MAURY		2250 SANTA FE P	/ /	--	--	OTHER	-- - --		- -	Y	HOME
0057NE 1	94001171	BELL_____VIRG	04/01/1994	350	18	63	OPEN	GOOD	- -		00120
MAURY	D0001467	PARSONS BEND RD	/ /	115	60	OTHER	63 - 350		- -	Y	HOME
0057NE 2	11900181	THURMAN E	/ /19	235	12	--		GOOD	35-44-12	S	00120
MAURY			/ /	44	94		-- - --		87-04-20		HOME
0057NE 2	11900231	HAYWOOD	05/26/1966	70	3	15		GOOD	35-43-46	S	00252
MAURY			/ /	30	30	STEEL	-- - --		87-02-41		HOME
0057NE 2	11900562	WALKERS J	07/24/1971	65	--	21		BAD	35-44-14	S	00120
MAURY			/ /	30	30	STEEL	-- - --		87-04-02		FARM
0057NE 2	11900864	GOAD G.	09/10/1976	300	1	21		GOOD	35-43-12	S	00120
MAURY			/ /	40	32	STEEL	-- - --		87-03-41		FARM
0057NE 2	11900866	STEWART E.	09/29/1976	325	31	21		GOOD	35-43-35	S	00120
MAURY			/ /	290	190	STEEL	-- - --		87-03-53		HOME
0057NE 2	11900872	MCMINN L.	11/11/1976	75	12	22		BAD	35-43-35	S	00120
MAURY			/ /	45	30	STEEL	-- - --		87-03-53		HOME
0057NE 2	11900970	KAPUGA R.	10/19/1979	175	5	25		GOOD	35-43-24	S	00015
MAURY			/ /	155	--	STEEL	-- - --		87-03-06		HOME
0057NE 2	11901181	D&M_BUILDERS___	01/15/1987	85	12	20	OPEN	GOOD	35-43-14	S	00120
MAURY		FITZGERALD	04/13/1987	75	--	OTHER	20 - 85		87-03-48	Y	HOME
0057NE 2	11901290	PORTER_____WALT	05/24/1989	360	1	20	OPEN	OTHR	- -		00227
MAURY		GRAVEL HILL	/ /	30	--	OTHER	20 - 360		- -	Y	HOME
0057NE 2	92001309	MCNELLY_____RAY_	03/23/1992	1026	5	41	OPEN	GOOD	- -		00015
MAURY		PETTY LN	/ /	--	--	STEEL	41 - 1026		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GODWIN QUADRANGLE (0057NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0057NE 2 MAURY	92001310	MCNEILY_____RAY_ PETTY LN	03/23/1991 / /	310 80	1 --	20 STEEL	OPEN 20 - 310	GOOD	- - - -	 Y	00015 HOME
0057NE 2 MAURY	93004040	MCKAY_____CAME MAHAN	09/27/1993 / /	100 50	6 --	20 OTHER	OPEN 20 - 100	OTHR	- - - -	 Y	00227 HOME
0057NE 3 MAURY	11900380	DAMRON O	06/24/1968 / /	325 190	1 100	20 STEEL	 -- - --	GOOD	35-42-58 87-00-57	S	00292 HOME
0057NE 3 MAURY	11900533	SCHOATS M	08/04/1970 / /	200 45	1 --	20 STEEL	 -- - --		35-44-28 87-01-37	S	00120 FARM
0057NE 3 MAURY	11900552	CLARK E.	05/25/1971 / /	260 170	-- 20	21 STEEL	 -- - --	GOOD	35-44-47 87-00-37	S	00120 FARM
0057NE 3 MAURY	11900600	CLARK	10/29/1971 / /	102 45	8 25	21 STEEL	 -- - --	GOOD	35-44-39 87-00-36	S	00252 HOME
0057NE 3 MAURY	11900621	SOUTH B	05/22/1972 / /	147 125	-- 50	22 STEEL	 -- - --	GOOD	35-44-10 87-00-37	S	00058 HOME
0057NE 3 MAURY	11901122	MCKAY_____CAME MAHON	07/29/1985 / /	225 170	12 --	20 OTHER	OPEN 20 - 225	FAIR	- - - -	 Y	00120 HOME
0057NE 3 MAURY	94000627 D0002005	HOWARD_____RAND PETTY LANE	03/16/1994 / /	300 --	-- --	20 OTHER	OPEN 20 - 300	OTHR	- - - -	 Y	00227 HOME
0057NE 4 MAURY	11900163	HUGHES H	05/08/1965 / /	339 117	1 100	67 STEEL	 -- - --	GOOD	35-41-34 87-05-19	S	00252 HOME
0057NE 4 MAURY	11900229	HUGHES H	/ /19 / /	220 140	3 75	15 STEEL	 -- - --	GOOD	35-41-34 87-05-19	S	00252 HOME
0057NE 4 MAURY	11900393	HOOD B	09/18/1968 / /	100 75	100 --	20 STEEL	 -- - --		35-41-58 87-05-34	S	00120 HOME
0057NE 4 MAURY	11900468	JOHNSON M.P.	10/15/1969 / /	1016 1006	2 118	22 STEEL	 -- - --		35-41-37 87-05-23	S	00120 HOME
0057NE 4 MAURY	11900635	WOODY B	11/24/1972 / /	200 100	1 --	21 STEEL	 -- - --		35-42-14 87-06-13	S	00120 FARM
0057NE 4 MAURY	11900661	ASBRIGE J	03/15/1972 / /	100 65	-- --	21 STEEL	 -- - --		35-41-27 87-05-03	S	00178 FARM
0057NE 4 MAURY	11901267	MCMEEN_____FREE ROBERTS BEND	10/21/1988 / /	250 85	2 60	20 OTHER	OPEN 20 - 250	GOOD	- - - -	 Y	00640 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GODWIN QUADRANGLE (0057NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0057NE 4	91000047	LAWLER_____MIKE	10/26/1990	300	0	--	OPEN	OTHR	- -		00640
MAURY		SANTAFE PK	/ /	--	--	OTHER	0 - 300		- -	Y	HOME
0057NE 4	91000048	LAWLER_____MIKE	10/29/1990	250	3	20	OPEN	GOOD	- -		00640
MAURY		SANTA FE PK	/ /	225	40	OTHER	20 - 250		- -	Y	HOME
0057NE 5	11900006	RICHARDSON J	09/12/1963	200	6	5		GOOD	35-41-12	S	00120
MAURY			/ /	180	100	STEEL	-- - --		87-03-20		HOME
0057NE 5	11900135	PARKS J	12/18/1964	304	15	9		GOOD	35-41-35	S	00058
MAURY			/ /	294	150	STEEL	-- - --		87-02-38		HOME
0057NE 5	11900354	WILEY C	07/18/1967	100	10	21		GOOD	35-41-16	S	00120
MAURY			/ /	40	40	STEEL	-- - --		87-04-01		HOME
0057NE 5	11900395	THURMAN F	09/29/1968	125	150	21			35-41-26	S	00120
MAURY			/ /	98	--	STEEL	-- - --		87-04-50		HOME
0057NE 5	11900397	PREICES E	10/07/1968	140	100	21			35-41-25	S	00120
MAURY			/ /	115	--	STEEL	-- - --		87-04-49		HOME
0057NE 5	11901095	DAVIS_____JOHN	09/24/1984	225	0	49	OPEN	OTHR	- -		00120
MAURY		DOWELL BRANCH	/ /	--	--	OTHER	49 - 225		- -	Y	HOME
0057NE 5	11901096	DAVIS_____JOHN	09/14/1984	295	--	--		OTHR	- -		00120
MAURY		DOWELL BRANCH	/ /	--	--	OTHER	-- - --		- -	Y	HOME
0057NE 5	11901097	DAVIS_____JOHN	09/19/1984	205	1	46	OPEN	GOOD	- -		00120
MAURY		DOWELL BRANCH	/ /	58	48	OTHER	46 - 205		- -	Y	HOME
0057NE 5	94000626	HOWARD_____RAND	03/17/1994	150	15	20	OPEN	OTHR	- -		00227
MAURY	D0002006	PETTY LN	/ /	130	--	OTHER	20 - 150		- -	Y	HOME
0057NE 6	11900173	WALLS D	07/09/1965	225	--	20			35-41-28	S	00252
MAURY			/ /	--	--	STEEL	-- - --		87-00-28		
0057NE 6	11900176	PARKS N	/ /19	306	50	31		GOOD	35-41-18	S	00120
MAURY			/ /	165	125	STEEL	-- - --		87-01-52		HOME
0057NE 6	11900194	WEST GLEN	08/18/1965	153	4	7	OPEN	BAD	35-41-15	S	00058
MAURY		DARKS MILL	/ /	68	40	STEEL	7 - 153		87-01-26	Y	HOME
0057NE 6	11901059	STAR DAIRY	8/28/1983	260	2	21		H2S	35-40-24	S	00103
MAURY		THETA RD	/ /	49	0	STEEL	21 - 260		87-02-17	Y	
0057NE 6	11901131	TVA_____	11/04/1985	300	0	20	OPEN	OTHR	- -		00120
MAURY		CARTER CREEK	/ /	--	--	OTHER	20 - 300		- -	Y	IND

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GODWIN QUADRANGLE (GOOD NOT IN)

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0057NE 6 MAURY	11901132	TVA_____ CARTERS CREEK	11/05/1985 07/28/1986	300 175	3 --	20 OTHER	OPEN 20 - 300	BAD	35-39-35 87-02-38	M Y	00120 IND
0057NE 7 MAURY	11900026	GREY T	09/28/1963 / /	210 170	1 20	4 STEEL	-- - --	BAD	35-37-52 86-06-30	S	00120 HOME
0057NE 7 MAURY	11900065	VENSON W	04/07/1964 / /	127 50	20 40	7 STEEL	-- - --	GOOD	35-38-33 87-06-15	S	00120 HOME
0057NE 7 MAURY	11900069	JOICE K	03/13/1964 / /	262 245	4 160	21 STEEL	-- - --	GOOD	35-38-23 87-06-09	S	00120 HOME
0057NE 7 MAURY	11900464	SMITH C	11/02/1969 / /	540 510	4 --	23 STEEL	-- - --	GOOD	35-38-18 87-06-11	S	00015 HOME
0057NE 7 MAURY	11900873	BOOKER J.	11/08/1976 / /	1050 --	6 150	-- STEEL	-- - --	GOOD	35-38-12 87-05-58	S	00120 HOME
0057NE 7 MAURY	11901113	COTHRAN_____KERN OLD WILLIAMSPOR	03/21/1985 / /	1250 1025	12 --	285 OTHER	OPEN 285 - 1250	OTHR	- - - -	Y	00120 FARM
0057NE 7 MAURY	11901127	MABRY_____KENN OLD WILLIAMS PO	11/12/1985 / /	360 80	1 --	20 OTHER	OPEN 20 - 360	OTHR	- - - -	Y	00120 HEAT
0057NE 7 MAURY	11901128	MABRY_____KENN OLD WILLIAMSPOR	11/13/1985 / /	360 --	-- --	20 OTHER	OPEN 20 - 360	OTHR	- - - -	Y	00120 HEAT
0057NE 7 MAURY	91000724	RICHARDSON_____CHAR ESTES	02/06/1991 / /	345 --	0 --	20 OTHER	OPEN 20 - 245	GOOD	- - - -	Y	00120 HOME
0057NE 8 MAURY	11900029	GRAY M	11/16/1963 / /	120 120	1 1	661 STEEL	-- - --		35-39-22 87-04-00	S	00000 HOME
0057NE 8 MAURY	11900120	EMBER P	07/23/1964 / /	175 160	6 65	24 STEEL	-- - --	GOOD	35-37-38 87-04-32	S	00120 HOME
0057NE 8 MAURY	11900151	SISK D	03/19/1965 / /	300 240	20 40	39 STEEL	-- - --		35-39-40 87-03-43	S	00120 HOME
0057NE 8 MAURY	11900183	SLUG C	/ /19 / /	190 158	24 120	31 STEEL	-- - --	GOOD	35-39-00 87-02-52	S	00120 IND
0057NE 8 MAURY	11900215	BROUSONPP	12/13/1965 / /	205 165	1 40	60 STEEL	-- - --	GOOD	35-39-22 87-04-10	S	00252 IND
0057NE 8 MAURY	11900230	KELLEY E	/ /19 / /	187 130	7 50	20 STEEL	-- - --	GOOD	35-39-49 87-04-47	S	00252 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GODWIN QUADRANGLE (0057NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0057NE 8 MAURY	11900240	GIBSON L	08/18/1966 / /	1000 640	2 50	10 STEEL	 -- - --	GOOD	35-39-20 87-03-29	S	00252 IND
0057NE 8 MAURY	11900330	LUNA J	10/31/1967 / /	950 890	2 40	21 STEEL	 -- - --	GOOD	35-39-58 87-04-30	S	00120 MDOM
0057NE 8 MAURY	11900875	HERMAN G.	/ /19 / /	1000 905	18 120	23 STEEL	 -- - --	GOOD	35-38-17 87-11-31	S	00120 HOME
0057NE 9 MAURY	11900227	REESE J	06/17/1966 / /	840 800	3 100	5 STEEL	 -- - --	GOOD	35-39-18 87-00-59	S	00252 HOME
0057NE 9 MAURY	11901171	TUCKER_____ARCH WEATHERSPOON RD	03/23/1987 / /	125 80	1 --	20 OTHER	OPEN -- - --	OTHR	- - - -	 Y	00001 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE QUADRANGLE (0057SE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0057SE	11900389	LANGA A	10/21/1968	988	10	22			35-36-30	T	00120
MAURY		CAYCE LANE	/ /	960	122	STEEL	-- - --		87-05-30		
0057SE	11909172	DR.ANDY BERRY	08/00/1975	1179	8	--		GOOD	- -		00120
MAURY			/ /	1150	131		-- - --		- -		
0057SE	11909184	CLIFFORD CARTER	11/00/1962	740	10	--		GOOD	- -		00416
MAURY			/ /	--	--		-- - --		- -		
0057SE	11909188	MARLIN CHURCH	08/11/1971	1072	--	--			- -		00120
MAURY			/ /	1040	178		-- - --		- -		
0057SE	11909194	DOUGLAS DEMASTUS	11/24/1969	951	31	--		GOOD	- -		00120
MAURY			/ /	80	85		-- - --		- -		
0057SE 1	11900175	ESKEW F	/ /19	190	24	13		GOOD	35-36-03	S	00120
MAURY			/ /	174	100	STEEL	-- - --		87-05-43		HOME
0057SE 1	11900191	JOHNS M	04/21/1965	202	18	18		GOOD	35-37-10	S	00120
MAURY			/ /	180	100	STEEL	-- - --		87-06-09		HOME
0057SE 1	11901203	BRADLEY_____BERN	07/02/1987	105	50	64	OPEN	GOOD	- -		00120
MAURY		JEWELL DR	/ /	80	22	OTHER	64 - 105		- -	Y	IRR
0057SE 1	90002513	UNDERWOOD_____DONA	07/05/1990	105	20	20	OPEN	BAD	- -		00640
MAURY		SUGAR HILL	/ /	22	2	OTHER	0 - 105		- -	Y	HOME
0057SE 2	90000757	L_D_S_CHURCH___	09/28/1989	320	1	--		OTHR	- -		00227
MAURY		HY WAY 50	/ /	70	--	OTHER	-- - --		- -	Y	IRR
0057SE 3	11900062	PRINCE D	/ /19	825	--	12		BAD	35-35-41	S	00100
MAURY			/ /	--	--	STEEL	-- - --		87-00-02		HOME
0057SE 3	11900178	GRAY F	05/25/1965	186	1	--		GOOD	35-35-32	S	00120
MAURY			/ /	130	80		-- - --		87-01-39		HOME
0057SE 3	11900198	WHITE H	08/30/1965	202	2	11		BAD	35-35-53	S	00058
MAURY			/ /	80	30	STEEL	-- - --		87-00-35		HOME
0057SE 3	11900528	HARDY J	09/02/1970	185	15	23			35-36-38	S	00120
MAURY			/ /	140	58	STEEL	-- - --		87-00-02		HOME
0057SE 3	11909044	GLADYS CHEEK	/ /19	--	--	--			35-35-27	S	
MAURY			/ /	--	--		-- - --		87-00-20		OTHR
0057SE 3	11909047	W E CHEEK	/ /19	--	--	--			35-35-26	S	
MAURY			/ /	--	57		-- - --		87-00-15		OTHR

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE COLUMBIA QUADRANGLE (0057SE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0057SE 3	11909048	MAE CRAIN HOWELL	/ /19	--	--	--			35-35-29	S	
MAURY			/ /	--	--		-- - --		87-00-00		OTHR
0057SE 3	11909049	WADE CHAPPELL	/ /19	--	--	--			35-35-58	S	
MAURY			/ /	--	37		-- - --		87-00-29		OTHR
0057SE 3	11909050	WADE CHAPPELL	/ /19	--	--	--			35-35-51	S	
MAURY			/ /	--	--		-- - --		87-00-31		OTHR
0057SE 3	11909051	DAVID T WARREN	/ /19	--	--	--			35-35-26	S	
MAURY			/ /	--	--		-- - --		87-00-15		OTHR
0057SE 3	11909055	W F HARMON	/ /19	--	--	--			35-36-01	S	
MAURY			/ /	--	--		-- - --		87-00-31		OTHR
0057SE 3	11909056	W F HARMON	/ /19	--	--	--			35-36-03	S	
MAURY			/ /	--	--		-- - --		87-00-29		FARM
0057SE 4	11900021	PATRICK J	11/22/1963	375	3	25		GOOD	35-33-09	S	00057
MAURY			/ /	360	--	STEEL	-- - --		87-06-28		HOME
0057SE 4	11900096	JONES F	05/15/1964	200	15	16			35-33-36	S	00120
MAURY			/ /	170	60	STEEL	-- - --		87-05-56		HOME
0057SE 4	11900774	YOUNGBLOOD E	09/30/1974	1170	10	69		GOOD	35-34-30	T	00015
MAURY		TROUSDALE	/ /	1170	300	STEEL	-- - --		87-06-00		HOME
0057SE 4	11900831	JEWELL C.	04/04/1975	1100	18	21		GOOD	35-34-10	S	00120
MAURY			/ /	1095	--	STEEL	-- - --		87-06-51		HOME
0057SE 4	11901184	NICKOLSON_____ GRAN	02/11/1987	145	12	20	OPEN	FAIR	- -		00120
MAURY		TROUSDALE LANE	/ /	25	4	OTHER	20 - 145		- -	Y	OTHR
0057SE 4	11901248	MOBLEY_____HENR	07/30/1988	105	0	--		OTHR	- -		00640
MAURY		SOWELL HOLLOW	/ /	--	--	OTHER	-- - --		- -	Y	HOME
0057SE 4	11901249	MOBLEY_____HENR	07/31/1988	105	1	20	OPEN	GOOD	- -		00640
MAURY		SOWELL HOLLOW	/ /	18	--	OTHER	20 - 105		- -	Y	HOME
0057SE 4	11901252	JENKINS_____KENN	07/31/1988	65	0	20	OPEN	OTHR	- -		00640
MAURY		TROUSDALE LANE	/ /	--	--	OTHER	20 - 65		- -	Y	HOME
0057SE 4	11909230	JEWELL CHAR	04/07/1975	1100	18	--		GOOD	35-34-30	T	00120
MAURY		HIDHWAY 43	/ /	1050	42		-- - --		87-07-30		
0057SE 5	11900027	KENNEDY F	10/16/1963	239	10	12		GOOD	35-33-29	S	00120
MAURY			/ /	215	98	STEEL	-- - --		87-02-45		HOME

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0057SE 5	11900028	LITTON L	11/01/1963	97	10	14		BAD	35-34-25	S	00120
MAURY			/ /	44	35	STEEL	-- - --		87-03-43		HOME
0057SE 5	11900100	WEBSTER G	05/15/1964	137	10	12		GOOD	35-34-43	S	00120
MAURY			/ /	123	65	STEEL	-- - --		87-03-26		HOME
0057SE 5	11900192	MCFARLAND L	05/03/1965	165	5	22			35-33-12	S	00120
MAURY			/ /	150	5	STEEL	-- - --		87-02-40		HOME
0057SE 5	11900859	CHAPMAN F.	07/21/1976	100	5	22		GOOD	35-33-15	S	00120
MAURY		ALBERT MATHEWS	/ /	45	30	STEEL	-- - --		87-04-25		HOME
0057SE 5	11901052	OWENS COTT	5/27/1983	514	20	21		GOOD	- -		00103
MAURY		INDIAN SPRINGS	/ /	337	90	STEEL	21 - 514		- -	Y	
0057SE 6	11900038	VOSS J	01/02/1964	226	1	17		GOOD	35-33-12	S	00058
MAURY			/ /	160	109	STEEL	-- - --		87-01-08		HOME
0057SE 6	11900124	HOMMONS P	07/02/1964	98	30	38		GOOD	35-34-56	S	00120
MAURY			/ /	65	43	STEEL	-- - --		87-01-30		HOME
0057SE 6	11900152	RUMMAGE A	11/14/1964	200	--	14		GOOD	35-33-58	S	00120
MAURY			/ /	50	40	STEEL	-- - --		87-00-25		HOME
0057SE 6	11900189	WITHERSPOON R	04/05/1965	735	2	15		GOOD	35-34-38	S	00120
MAURY			/ /	720	94	STEEL	-- - --		87-00-10		OTHR
0057SE 6	11900295	HICKMAN U	06/14/1966	935	2	30			35-33-43	S	00120
MAURY			/ /	935	100	STEEL	-- - --		87-01-15		HOME
0057SE 6	11901153	SANDERS_____FRED	02/26/1986	248	1	20	OPEN	GOOD	- -		00640
MAURY		HAYES DENTON	/ /	35	25	STEEL	20 - 248		- -	Y	HOME
0057SE 6	11901272	BREWER_____LARR	02/02/1988	85	50	20	OPEN	GOOD	35-29-06	S	00640
MAURY		COVEY HOLLOW	05/04/1989	40	6	OTHER	-- - --	001783	87-00-37	Y	HOME
0057SE 6	11901280	FREDERICK_____ DR_D	05/08/1989	105	0	--		OTHR	- -		00640
MAURY		KIPPSFORD POND	/ /	--	--	OTHER	-- - --		- -	Y	IRR
0057SE 6	11909033	WILLIAM H TROOP	/ /19	--	--	--			35-33-32	S	
MAURY			/ /	--	--		-- - --		86-00-06		HOME
0057SE 6	11909036	WILSON F WITHERSPOO	/ /19	--	--	--			35-34-25	S	
MAURY			/ /	--	--		-- - --		86-00-03		HOME
0057SE 6	11909037	DAISY DEAN	/ /19	--	--	--			35-34-47	S	
MAURY			/ /	--	60		-- - --		87-00-10		OTHR

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0057SE 7 MAURY	11900211	GADCOURT R	11/11/1965 / /	320 280	-- 250	5 STEEL	 -- - --	GOOD	35-30-04 87-06-28	S	00252 HOME
0057SE 7 MAURY	11901163	NORMAN_____DALE REESE CHURCH	08/14/1986 / /	225 60	0 --	20 OTHER	OPEN 20 - 225	OTHR	- - - -	 Y	00120 HOME
0057SE 7 MAURY	11901235	VICK_____DOUG SOWELL HOLLOW	06/14/1988 / /	85 55	5 --	20 OTHER	OPEN 20 - 85	GOOD	- - - -	 Y	00640 HOME
0057SE 7 MAURY	91000715	GRZYBOWSKI_____ROBE SOWELL HOLLOW R	08/10/1987 5/ 5/1990	300 80	4 16	20 OTHER	OPEN 20 - 300	OTHR 001704	35-32-24 87-07-26	S Y	00640 HOME
0057SE 7 MAURY	91000716	GRYZBOWSKI_____ROBE SOWELL HOLLOW	10/18/1987 / /	125 --	0 6	-- OTHER	 -- - --	OTHR	- - - -	 Y	00640 HOME
0057SE 7 MAURY	91000717	GRZYBOWSKI_____ROBE SOWELL HOLLOW	10/16/1987 / /	125 90	0 --	-- OTHER	 -- - --	OTHR	- - - -	 Y	00640 HOME
0057SE 7 MAURY	91000718	CRZYBOWSKI_____ROBE SOWELL HOLLOW	10/12/1987 / /	225 --	-- --	-- OTHER	 -- - --	OTHR	- - - -	 Y	00640 OTHR
0057SE 7 MAURY	91000719	GRZYBOWSKI_____ROBE SOWELL HOLLOW	10/10/1987 / /	100 70	1 --	-- OTHER	OPEN 20 - 70	OTHR	- - - -	 Y	00640 HOME
0057SE 8 MAURY	11900017	SCRIFINCE P	10/22/1963 / /	309 145	1 70	20 STEEL	 -- - --	GOOD	35-32-02 87-02-54	S	00058 HOME
0057SE 8 MAURY	11900113	SCRIFNER E	10/12/1964 / /	46 46	30 20	46 STEEL	 -- - --	GOOD	35-31-02 87-03-18	S	00058 HOME
0057SE 8 MAURY	11900182	HARRIS J	06/17/1965 / /	250 90	-- 200	18 STEEL	 -- - --	GOOD	35-31-09 87-04-06	S	00120 HOME
0057SE 8 MAURY	11900187	MORROW E	07/16/1965 / /	346 335	-- 246	9 STEEL	 -- - --		35-31-14 87-04-44	S	00120 HOME
0057SE 8 MAURY	11900188	HARRIS MARY BIGBYVILLE	06/30/1965 / /	168 90	0 80	6 STEEL	OPEN 6 - 168		35-31-17 87-03-55	S Y	00120 HOME
0057SE 8 MAURY	11900193	BENDERMAN L	05/21/1965 / /	260 210	11 75	38 STEEL	 -- - --		35-30-01 87-03-15	S	00120 HOME
0057SE 8 MAURY	11900576	GILLIAM J BIGBYVILLE	06/27/1971 / /	945 930	2 100	21 STEEL	 -- - --	GOOD	35-31-30 87-00-00	T	00120 FARM
0057SE 8 MAURY	11900871	FARRIS W.	11/12/1976 / /	75 40	200 6	51 STEEL	 -- - --	GOOD	36-30-46 87-02-50	S	00120 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE COLUMBIA QUADRANGLE (0057SE) TN.

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0057SE 8	11901105	MATTHEWS_____DUNC	02/28/1985	290	2	22	OPEN	OTHR	- -		00120
MAURY		HOPEWELL	/ /	120	--	OTHER	22 - 290		- -	Y	HOME
0057SE 8	11909249	MCCAINS C.P.CHURCH	03/28/1966	934	3	--		GOOD	35-31-00	T	00058
MAURY		MCCAINS LANE	/ /	824	113		-- - --		87-03-00		MDOM
0057SE 9	11900018	JACKSON B	11/16/1963	300	--	18		GOOD	35-30-57	S	00058
MAURY			/ /	70	22	STEEL	-- - --		87-00-10		HOME
0057SE 9	11900123	PERRY H	06/06/1964	225	1	13		GOOD	35-31-48	S	00120
MAURY			/ /	220	5	STEEL	-- - --		87-00-53		OTHR
0057SE 9	11900142	HINDMAN H	01/22/1965	75	25	10		BAD	35-30-35	S	00100
MAURY			/ /	65	25	STEEL	-- - --		87-01-53		HOME
0057SE 9	11900172	ERWIN C	/ /19	300	3	35	OPEN	BAD	35-30-22	S	00252
MAURY		COVEY HOLLOW	/ /	290	135	STEEL	35 - 300		87-01-53	Y	HOME
0057SE 9	11900221	CHURCH	03/28/1966	934	1	16		BAD	35-30-41	S	00058
MAURY			/ /	824	113	STEEL	-- - --		87-01-45		HOME
0057SE 9	11900451	BIBLE B	03/30/1970	817	4	--		GOOD	35-31-28	S	00058
MAURY			/ /	806	22		-- - --		87-00-11		HOME
0057SE 9	11901093	CHEATHAM_____GRAN	09/27/1984	150	5	21	OPEN	GOOD	- -		00120
MAURY		COVEY HOLLOW	/ /	67	--	STEEL	21 - 150		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE QUADRANGLE (0064NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064NW	11900293	FOSTER B	09/14/1966	890	2	33		GOOD	- -		00120
MAURY			/ /	885	110	STEEL	-- - --		- -		HOME
0064NW	11900536	HUMBLE OIL CO	07/09/1970	892	12	21			- -		00120
MAURY			/ /	870	89	STEEL	-- - --		- -		COMM
0064NW	11900549	BUTLER G	11/30/1971	895	4	20		BAD	- -		00058
MAURY			/ /	885	130	STEEL	-- - --		- -		HOME
0064NW	11900606	SMITH W	08/01/1971	926	3	20		BAD	- -		00058
MAURY			/ /	920	140	STEEL	-- - --		- -		
0064NW	11900638	BEARD C	07/05/1972	755	6	23		BAD	- -		00120
MAURY			/ /	730	--	STEEL	-- - --		- -		FARM
0064NW	11900712	JONES G	03/13/1973	1028	4	28		GOOD	- -		00120
MAURY			/ /	1000	--	STEEL	-- - --		- -		FARM
0064NW	11900790	ROBERT.HALL	08/29/1974	774	15	--		GOOD	- -		00120
MAURY			/ /	770	84		-- - --		- -		
0064NW	11909170	JAMES BAILEY	04/05/1973	863	3	--			- -		00120
MAURY			/ /	--	47		-- - --		- -		
0064NW	11909175		00/00/1955	--	--	--			- -		00416
MAURY			/ /	--	--		-- - --		- -		
0064NW	11909181	TOM CAMUSE	02/00/1962	770	5	--		GOOD	- -		
MAURY			/ /	765	--		-- - --		- -		
0064NW	11909183	ROBERT L. CARPENTER	00/00/1962	750	5	--		GOOD	- -		00057
MAURY			/ /	745	--		-- - --		- -		
0064NW	11909186	HOWARD HARTLEY	12/27/1971	726	3	--			- -		00227
MAURY			/ /	700	81		-- - --		- -		
0064NW	11909187	AUSTIN CHAPPELL	00/00/1960	801	--	--		BAD	- -		00416
MAURY			/ /	--	50		-- - --		- -		
0064NW	11909196	ROY CARUTHERS	04/23/1968	989	5	--		BAD	- -		00058
MAURY			/ /	985	166		-- - --		- -		
0064NW	11909197	RAYMOND CATES	08/04/1973	802	4	--			- -		00120
MAURY			/ /	750	93		-- - --		- -		
0064NW	11909199	MARLON HENDRICKS	00/00/1960	754	5	--		BAD	- -		00057
MAURY			/ /	750	--		-- - --		- -		

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0064NW	11909202	EARL HAYES	03/02/1966	794	10	--		BAD	- -		00120
MAURY			/ /	790	--		-- - --		- -		
0064NW	11909204	HOWARD HARTLEY	12/27/1971	726	3	--			- -		00227
MAURY			/ /	700	81		-- - --		- -		
0064NW	11909207	WALLACE HALL	11/13/1971	905	5	--			- -		00120
MAURY			/ /	890	121		-- - --		- -		
0064NW	11909212	RICHARD FORD	11/25/1969	1004	7	--			- -		00058
MAURY			/ /	1000	--		-- - --		- -		
0064NW	11909214	ALMOND FITZGERALD	00/00/1962	814	5	--			- -		00058
MAURY			/ /	810	--		-- - --		- -		
0064NW	11909218	NOEL EVANS	12/07/1966	918	1	--		GOOD	- -		00120
MAURY			/ /	880	17		-- - --		- -		
0064NW	11909221	JOE DUVALL	05/28/1968	798	15	--		GOOD	- -		00120
MAURY			/ /	784	119		-- - --		- -		
0064NW	11909231	TOMMY JOHNSON	00/00/1960	784	--	--			- -		00416
MAURY			/ /	--	36		-- - --		- -		
0064NW	11909240	LARRY LOGUE	11/00/1970	921	1	--		BAD	- -		00058
MAURY			/ /	--	130		-- - --		- -		
0064NW	11909242	GENE LOVETT	00/00/1959	778	5	--		GOOD	- -		00057
MAURY			/ /	775	--		-- - --		- -		
0064NW	11909243	DR.DOUGLAS OVERTON	10/01/1964	835	--	--			- -		00252
MAURY			/ /	--	--		-- - --		- -		
0064NW	11909245	T.B.MALONE	10/12/1971	741	3	--		GOOD	- -		00252
MAURY			/ /	--	47		-- - --		- -		
0064NW	11909250	JESSE MCNEELY	07/00/1962	750	--	--			- -		
MAURY			/ /	--	--		-- - --		- -		
0064NW	11909254	KENNETH MULLINEX	11/00/1961	893	3	--		BAD	- -		00058
MAURY			/ /	860	100		-- - --		- -		
0064NW	11909259	DR.DOUGLAS OVERTON	10/01/1964	835	--	--			- -		00252
MAURY			/ /	758	--		-- - --		- -		
0064NW	11909260	FOSTER PARKS	00/00/1962	901	--	--			- -		
MAURY			/ /	--	--		-- - --		- -		

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE QUADRANGLE (0064NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064NW	11909263	EVELYN PRINCE	02/22/1972	820	3	--			- -		00120
MAURY			/ /	800	36		-- - --		- -		
0064NW	11909265	ABENY (NOEL EVANS)	12/07/1966	918	1	--		GOOD	- -		00120
MAURY			/ /	880	17		-- - --		- -		
0064NW	11909267	JOHN REESE	04/30/1971	817	4	32		GOOD	- -		00120
MAURY			/ /	800	107		-- - --		- -		
0064NW	11909268	GARRETT RIGGS	10/09/1972	928	2	--			- -		00120
MAURY			/ /	900	66		-- - --		- -		
0064NW	11909269	GARRETT R.RIGGS NO-	02/26/1973	1214	--	--			- -		00120
MAURY			/ /	--	--		-- - --		- -		
0064NW	11909274	VIRGIL SEALEY	00/00/1962	790	5	--			- -		00057
MAURY			/ /	780	--		-- - --		- -		
0064NW	11909276	J.B.SIMMONS,JR.	00/00/1960	775	10	--		BAD	- -		00416
MAURY			/ /	775	20		-- - --		- -		
0064NW	11909278	WILBURN SMITH	/ /19	--	--	--			- -		00416
MAURY			/ /	--	--		-- - --		- -		
0064NW	11909288	JAMES C.VAUGHN NO-1	07/17/1969	939	12	--		GOOD	- -		00120
MAURY			/ /	930	165		-- - --		- -		
0064NW 1	11900166	QUICK J	08/06/1965	202	48	33		GOOD	35-42-41	S	00058
MAURY			/ /	180	90	STEEL	-- - --		86-58-48		HOME
0064NW 1	11900216	SULLIVAN S	12/15/1965	973	3	23		BAD	35-42-38	S	00058
MAURY			/ /	965	110	STEEL	-- - --		86-58-80		HOME
0064NW 1	11900294	U T EXPERIMENTAL	08/26/1966	860	2	31			35-43-13	S	00120
MAURY			/ /	850	95	STEEL	-- - --		86-57-58		MUN
0064NW 1	91000723	CRIGGER_____WALD	01/31/1991	85	40	62	OPEN	GOOD	- -		00120
MAURY			/ /	85	--	OTHER	62 - 85		- -	Y	HOME
0064NW 2	11900081	CRUMP T	07/08/1964	120	2	10		GOOD	35-44-37	S	00094
MAURY			/ /	40	12	STEEL	-- - --		86-55-29		HOME
0064NW 2	11900225	WEAVER J	02/24/1966	58	10	37		GOOD	35-43-15	S	00058
MAURY			/ /	45	20	STEEL	-- - --		86-55-24		HOME
0064NW 2	11900318	MUMS H	02/28/1967	155	200	10			35-44-25	S	00120
MAURY			/ /	138	12		-- - --		86-55-26		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064NW 2 MAURY	11900614	REED J	08/24/1972 / /	144 --	0 --	-- 	-- - --		35-42-41 86-55-25	S	00058 FARM
0064NW 2 MAURY	11900677	REID J	10/10/1972 / /	1025 775	-- --	21 STEEL	-- - --	GOOD	35-42-41 86-55-25	S	00492 HOME
0064NW 2 MAURY	93003691	NEAL_____MIKE CRAFTON RD	08/26/1993 / /	804 780	7 --	20 STEEL	OPEN 20 - 804	GOOD	- - - -	 Y	00015 HOME
0064NW 3 MAURY	11900056	RENOLD J	04/30/1964 / /	75 55	10 15	38 STEEL	-- - --	GOOD	35-43-20 86-53-50	S	00007 HOME
0064NW 3 MAURY	11900590	LUNN S	01/26/1971 / /	848 815	3 74	52 STEEL	-- - --	BAD	35-44-17 86-53-30	S	00120 FARM
0064NW 3 MAURY	11901193	SPRING_HILL____CITY LUNN	07/17/1987 / /	150 73	50 10	20 OTHER	OPEN 20 - 150	GOOD	- - - -	 Y	00120 MUN
0064NW 3 MAURY	11901194	SPRINGHILL_____CITY LUNN	07/20/1987 / /	175 85	6 9	20 OTHER	OPEN 20 - 175	OTHR	- - - -	 Y	00120 MUN
0064NW 4 MAURY	11900156	KINCAID O	04/06/1965 / /	203 133	-- --	6 STEEL	-- - --	BAD	35-40-37 86-57-41	S	00058 HOME
0064NW 4 MAURY	11900167	TALLEY H	07/24/1965 / /	802 795	1 80	34 STEEL	-- - --	BAD	86-58-55 35-41-48	S	00058 HOME
0064NW 4 MAURY	11900209	HOLANDSS	09/20/1965 / /	303 140	-- 75	7 STEEL	-- - --	BAD	35-40-26 86-59-35	S	00058 HOME
0064NW 4 MAURY	11900608	SHAYTON E	05/05/1971 / /	200 98	3 45	20 STEEL	-- - --	GOOD	35-40-45 86-57-45	S	00058 FARM
0064NW 4 MAURY	11900976	NICHOLSON L	09/26/1979 / /	950 915	3 --	42 STEEL	-- - --	GOOD	35-40-08 86-58-53	S	00120 HOME
0064NW 4 MAURY	94000089 D0000385	DUVALL_____KERI OLLIE CHUNN	11/30/1993 / /	165 80	3 --	20 STEEL	OPEN 20 - 165	GOOD	- - - -	 Y	00015 HOME
0064NW 5 MAURY	11900054	AKIN S	03/11/1964 / /	242 140	4 45	20 STEEL	-- - --	BAD	35-41-42 86-57-03	S	00058 HOME
0064NW 5 MAURY	11900117	LOGUE C	10/30/1964 / /	80 26	-- 11	17 STEEL	-- - --	GOOD	35-41-08 86-57-06	S	00057 HOME
0064NW 5 MAURY	11900118	BAUGUS O	11/07/1964 / /	225 170	-- --	18 STEEL	-- - --	BAD	35-40-56 86-57-35	S	00057 HOME

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0064NW 5	11900137	LOVETT E	12/02/1964	190	1	36		BAD	35-41-21	S	00057
MAURY			/ /	182	90	STEEL	-- - --		86-55-01		HOME
0064NW 5	11900146	SMITH E	01/24/1965	130	1	6		GOOD	35-41-45	S	00058
MAURY			/ /	40	30	STEEL	-- - --		86-56-31		HOME
0064NW 5	11900207	DALE J	10/15/1965	204	5	34		GOOD	35-40-49	S	00058
MAURY			/ /	180	75	STEEL	-- - --		86-56-26		HOME
0064NW 5	11900453	JONES S	04/28/1970	152	6	29		GOOD	35-41-30	S	00058
MAURY			/ /	145	20	STEEL	-- - --		86-55-15		
0064NW 5	11900619	WEST E C	07/14/1972	300	7	45		GOOD	35-40-37	S	00058
MAURY			/ /	270	120	STEEL	-- - --		86-57-17		HOME
0064NW 5	11900673	LOVE T	06/06/1973	281	5	36		GOOD	35-40-54	S	00492
MAURY			/ /	--	45	STEEL	-- - --		86-56-30		HOME
0064NW 5	11901224	AGENT_____HARO	09/09/1987	1055	10	24	OPEN	GOOD	- -		00120
MAURY		GREEN MILL	/ /	1050	55	OTHER	24 - 1055		- -	Y	HOME
0064NW 6	11900012	ABERNATHY S	09/28/1963	270	1	10		BAD	35-41-49	S	00057
MAURY			/ /	140	140	STEEL	-- - --		86-53-56		HOME
0064NW 6	11900061	WEAVER W	05/24/1964	903	1	25		BAD	35-42-25	S	00058
MAURY			/ /	850	140	STEEL	-- - --		86-54-45		HOME
0064NW 6	11900071	MCNEELY J	06/19/1964	75	12	10		BAD	35-42-10	S	00057
MAURY			/ /	58	5	STEEL	-- - --		86-53-59		HOME
0064NW 6	11900072	MCNEELY J	06/22/1964	92	44	23		GOOD	35-41-58	S	00057
MAURY			/ /	80	41	STEEL	-- - --		86-53-50		HOME
0064NW 6	11900073	RUMMAGE J	06/26/1964	57	110	68			35-42-07	S	00000
MAURY			/ /	89	12	STEEL	-- - --		86-53-56		HOME
0064NW 6	11900077	STEWART B	07/14/1964	200	0	100			35-40-55	S	00057
MAURY			/ /	--	--	STEEL	-- - --		86-52-56		HOME
0064NW 6	11900105	LEE B	10/06/1964	100	--	27		GOOD	35-40-08	S	00057
MAURY			/ /	68	35	STEEL	-- - --		86-53-53		HOME
0064NW 6	11900502	HARRIS C	03/16/1970	300	0	--			35-41-17	S	00252
MAURY			/ /	--	--		-- - --		86-54-37		OTHR
0064NW 6	11900558	BROWN H	08/23/1971	800	12	25		GOOD	35-41-33	S	00120
MAURY			/ /	785	124	STEEL	-- - --		86-53-19		FARM

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0064NW 6 MAURY	11900569	REESE J	04/28/1971 / /	815 795	4 --	33 STEEL	-- - --	GOOD	35-41-27 86-53-10	S	00120 FARM
0064NW 6 MAURY	11900617	LEE J	08/08/1972 / /	300 --	0 --	21 STEEL	-- - --		35-41-52 86-53-56	S	00492 OTHR
0064NW 6 MAURY	11900675	MURPHY F	02/15/1973 / /	868 885	-- 45	21 STEEL	-- - --	GOOD	35-41-43 86-53-28	S	00492 HOME
0064NW 6 MAURY	11900778	VAUGHN J.C.NO-2	09/13/1974 / /	1100 1075	4 184	26 STEEL	-- - --	GOOD	35-41-17 86-54-43	S	00120 FARM
0064NW 6 MAURY	11900781	PARRISH R.	/ /19 / /	-- --	-- --	21 STEEL	-- - --		35-40-16 86-54-26	S	
0064NW 6 MAURY	11900918	GREEN J	04/00/1978 / /	200 50	1 --	30 STEEL	-- - --	GOOD	35-40-27 86-54-27	S	00120 HOME
0064NW 6 MAURY	11900928	REED J	05/12/1978 / /	430 40	1 40	21 STEEL	-- - --	GOOD	35-42-15 86-54-53	S	00252 OTHR
0064NW 6 MAURY	11901050	JOHNSON THOM NEW LASER	6/10/1983 / /	145 45	0 18	21 STEEL	21 - 145	H2S	- - - -	Y	00103
0064NW 6 MAURY	11901051	JOHNSON BILL GREEN MILL RD	5/26/1983 / /	305 0	0 215	21 STEEL	21 - 305	OTHR	- - - -	Y	00103
0064NW 6 MAURY	11901142	ANDRE_____JON_ JOE PEAY	12/06/1985 / /	700 688	3 150	20 OTHER	OPEN 20 - 700	OTHR	- - - -	Y	00227 HOME
0064NW 6 WILLIAMSON	18702617	WEBB_____JOHN HOLT ROAD	04/21/1984 / /	207 180	25 --	-- OTHER	OPEN 150 - 207	GOOD	36-00-00 86-50-00	- Y	00015 HOME
0064NW 7 MARSHALL	11709015	RL YOUNG	/ /19 / /	-- --	-- 24	--	-- - --		35-38-17 86-59-23	S	OTHR
0064NW 7 MAURY	11900057	LOVETT F	04/20/1964 / /	995 808	-- 40	9 STEEL	-- - --	BAD	35-38-04 86-58-58	S	00057 HOME
0064NW 7 MAURY	11900066	PATTERSON W	04/16/1964 / /	125 90	2 50	20 STEEL	-- - --	BAD	35-38-12 86-59-35	S	00120 HOME
0064NW 7 MAURY	11900074	HILL W	07/06/1964 / /	225 90	1 60	16 STEEL	-- - --	GOOD	35-38-06 86-58-20	S	00057 HOME
0064NW 7 MAURY	11900140	PILKINTES D	01/29/1965 / /	145 53	-- 7	-- STEEL	-- - --	BAD	35-38-04 86-58-13	S	00057 HOME

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0064NW 7 MAURY	11900322	PARRETT H	03/10/1967 / /	135 115	25 20	22 STEEL	-- - --	GOOD	35-37-56 86-59-19	S	00120 HOME
0064NW 7 MAURY	11900605	BUTLER G	12/28/1971 / /	900 900	3 160	20 STEEL	-- - --	GOOD	35-37-47 86-58-38	S	00058 HOME
0064NW 7 MAURY	11900820	DELK J.	07/03/1975 / /	200 90	2 --	23 STEEL	-- - --	GOOD	35-38-48 86-59-18	S	00120 HOME
0064NW 7 MAURY	94001690 D0000438	THORNESBURY____JOHN CRANFORD HOLLOW	05/10/1994 / /	1090 1080	8 --	41 STEEL	OPEN 42 - 1090	GOOD	- - - -	 Y	00015 HOME
0064NW 8 MAURY	11900075	DERRYBERRY F	06/17/1964 / /	100 --	0 --	8 STEEL	-- - --		35-37-49 86-56-43	S	00057 HOME
0064NW 8 MAURY	11900079	BRADLEY E	06/29/1964 / /	76 65	20 40	19 STEEL	-- - --	BAD	35-38-10 86-57-00	S	00058 HOME
0064NW 8 MAURY	11900139	KINCAID B	02/05/1965 / /	50 12	1 11	11 STEEL	-- - --	GOOD	35-38-40 86-56-20	S	 HOME
0064NW 8 MAURY	11900335	SURYBERRY W	09/12/1967 / /	980 950	1 --	21 STEEL	-- - --	GOOD	35-38-33 86-57-23	S	00120 HOME
0064NW 8 MAURY	11900412	AMERICAN OIL CO	07/09/1968 / /	740 735	20 100	21 STEEL	-- - --		35-38-39 86-55-45	S	00120 COMM
0064NW 8 MAURY	11900515	BRADLEY	06/18/1970 / /	30 24	6 15	30 STEEL	-- - --	GOOD	35-38-09 86-56-59	S	00252 FARM
0064NW 8 MAURY	11900516	BRADLEY	06/04/1970 / /	180 170	1 100	0	-- - --	BAD	35-38-09 86-56-59	S	00252 FARM
0064NW 8 MAURY	11900685	DERRYBERRY J	06/12/1973 / /	300 100	1 --	23 STEEL	-- - --	GOOD	- - - -		00120 HOME
0064NW 9 MAURY	11900049	FOX R	02/10/1964 / /	812 795	2 85	22 STEEL	-- - --	BAD	35-39-18 86-53-27	S	00057 HOME
0064NW 9 MAURY	11900106	CONNELLY J	09/26/1964 / /	800 748	2 77	16 STEEL	-- - --	BAD	35-38-02 86-54-23	S	00057 HOME
0064NW 9 MAURY	11900110	CROFTON M	10/14/1964 / /	300 35	-- 25	-- 	-- - --		35-37-38 86-54-49	S	00057 HOME
0064NW 9 MAURY	11900219	VAUGHN & HALL	01/09/1966 / /	370 340	1 90	6 STEEL	-- - --	GOOD	35-39-27 86-53-52	S	00252 HOME

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0064NW 9	11900220	VAUGHN & HALL	01/08/1966	850	--	16			35-39-29	S	00252
MAURY			/ /	800	250	STEEL	-- - --		86-53-50		HOME
0064NW 9	11900323	HUCHEBY J	03/11/1967	95	10	21		GOOD	35-38-39	S	00120
MAURY			/ /	65	35	STEEL	-- - --		86-53-26		HOME
0064NW 9	11900427	BROWN L	06/28/1968	200	--	23		GOOD	35-38-41	S	00120
MAURY			/ /	35	--	STEEL	-- - --		86-52-17		HOME
0064NW 9	11900456	ANDERSON C	09/26/1969	125	30	22			35-38-36	S	00015
MAURY			/ /	85	30	STEEL	-- - --		86-53-14		COMM
0064NW 9	11900465	CADWELD W	02/19/1970	695	4	22			35-37-39	S	00015
MAURY			/ /	690	40	STEEL	-- - --		86-54-27		HOME
0064NW 9	11900523	GULF OIL CO	11/03/1970	789	6	22		GOOD	35-38-35	S	00120
MAURY			/ /	750	--	STEEL	-- - --		86-53-40		COMM
0064NW 9	11900565	MOORE H	07/07/1971	800	6	22		GOOD	35-38-39	S	00120
MAURY			/ /	785	127	STEEL	-- - --		86-53-33		COMM
0064NW 9	11900587	BRADLEY H	11/12/1971	35	8	23		GOOD	35-38-38	S	00120
MAURY			/ /	25	--	STEEL	-- - --		86-54-36		FARM
0064NW 9	11900647	ALLEN H	07/17/1972	935	3	22		GOOD	35-39-12	S	00120
MAURY			/ /	920	179	STEEL	-- - --		86-54-46		HOME
0064NW 9	11900657	ANDERSON R	05/12/1972	80	5	22		GOOD	35-38-41	S	00120
MAURY			/ /	30	--	STEEL	-- - --		86-52-42		HOME
0064NW 9	11900658	ANDERSON R	05/10/1972	155	0	26			35-38-41	S	00120
MAURY			/ /	--	--	STEEL	-- - --		86-52-42		HOME
0064NW 9	11900695	ANDERSON R	07/03/1973	725	12	21		BAD	35-38-42	S	00120
MAURY			/ /	700	30	STEEL	-- - --		86-52-44		HOME
0064NW 9	11901269	HOOD_____SUE_	04/11/1989	90	15	20	OPEN	FAIR	- -		00015
MAURY		SHARP	/ /	80	--	STEEL	20 - 90		- -	Y	HOME
0064NW 9	92001985	HARDIN_____BUDD	06/08/1992	175	6	20	OPEN	GOOD	- -		00120
MAURY		SHARP RD	/ /	140	40	OTHER	20 - 175		- -	Y	HOME
0064NW 9	92002873	WHITE_____TONY	05/16/1992	804	10	--	OPEN	GOOD	- -		00015
MARSHALL		OLD HWY 99	/ /	790	--	OTHER	350 - 804		- -	Y	FARM

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0064SW	11900263	CALLIAR L	03/27/1966	63	30	13		GOOD	35-31-47	S	00120
MAURY			/ /	30	21	STEEL	-- - --		86-57-25		HOME
0064SW	11900315	WILLIS D.	02/10/1967	895	6	35		BAD	- -		00120
MAURY			/ /	890	110	STEEL	-- - --		- -		HOME
0064SW	11900674	JAMESLSTOFEL	04/24/1973	888	1	21		GOOD	- -		00492
MAURY			/ /	872	47	STEEL	-- - --		- -		
0064SW	11900792	BROWN A.	07/20/1974	900	2	22		GOOD	- -		00120
MAURY			/ /	850	62	STEEL	-- - --		- -		HOME
0064SW	11900802	PENROD E.	02/18/1974	825	12	38		BAD	- -		00120
MAURY			/ /	810	60	STEEL	-- - --		- -		HOME
0064SW	11900805	DERRYBERRY P.	03/26/1974	775	2	22		GOOD	- -		00120
MAURY			/ /	745	82	STEEL	-- - --		- -		HOME
0064SW	11900806	BROWN D.	04/10/1974	720	30	55		BAD	- -		00120
MAURY			/ /	716	80	STEEL	-- - --		- -		FARM
0064SW	11909205	H.L.HARRIS	08/28/1970	922	5	--		GOOD	- -		00120
MAURY			/ /	900	129		-- - --		- -		
0064SW	11909222	EDW.M."NED"DENTON	04/16/1963	770	12	--		GOOD	- -		00058
MAURY			/ /	765	66		-- - --		- -		
0064SW	11909225	LAUON HOOI	02/09/1962	802	10	22		GOOD	- -		00120
MAURY			/ /	802	76		-- - --		- -		
0064SW	11909227	HUMBLE ESSO NO-2	08/13/1970	908	10	--			- -		00120
MAURY			/ /	880	128		-- - --		- -		
0064SW	11909228	ALFRED INGRAM	10/21/1968	934	8	--		BAD	- -		00058
MAURY			/ /	930	62		-- - --		- -		
0064SW	11909236	HAROLD LANDERS	11/03/1967	734	4	--		GOOD	- -		00058
MAURY			/ /	730	19		-- - --		- -		
0064SW	11909238	GENE LEGG	06/28/1963	868	--	--			- -		
MAURY			/ /	--	--		-- - --		- -		
0064SW	11909247	MRS LEX K.MARTIN	09/04/1962	677	10	--		GOOD	- -		
MAURY			/ /	670	32		-- - --		- -		
0064SW	11909261	JERRY PRIMM	07/21/1971	1042	1	20		GOOD	- -		00120
MAURY			/ /	980	22		-- - --		- -		

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE QUADRANGLE (0064SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW	11909271	ED SEAGRAUES	04/25/1969	726	8	--			- -		00120
MAURY			/ /	714	--		-- - --		- -		
0064SW	11909272	JOHN TINSLEY,JR.	10/01/1964	854	2	--		GOOD	- -		00120
MAURY			/ /	850	129		-- - --		- -		
0064SW	11909273	PAUL SCRIBNER	10/26/1972	924	2	--			- -		00120
MAURY			/ /	--	72		-- - --		- -		
0064SW	11909275	BEN SHELTON	12/07/1966	847	2	--			- -		00120
MAURY			/ /	825	22		-- - --		- -		
0064SW	11909280	D.E.STACEY	10/02/1963	1033	--	--			- -		00120
MAURY			/ /	--	259		-- - --		- -		
0064SW	11909285	CECIL UPSHAWSON	09/18/1963	820	3	--		GOOD	- -		00058
MAURY			/ /	800	65		-- - --		- -		
0064SW 1	11701157	KITTS_SERVICE_C	09/15/1988	290	7	124	OPEN	GOOD	- -		00015
MARSHALL		MOONS BEND	/ /	280	--	OTHER	124 - 290		- -	Y	HOME
0064SW 1	11900078	CHILDRES R	07/07/1964	98	2	8		GOOD	35-36-07	S	00058
MAURY			/ /	60	40		-- - --		86-58-45		HOME
0064SW 1	11900112	WEST J	11/05/1964	280	1	18		GOOD	35-36-37	S	00058
MAURY			/ /	70	--	STEEL	-- - --		86-59-40		HOME
0064SW 1	11900114	SHAPESON J	10/05/1964	345	--	28			35-37-20	S	00058
MAURY			/ /	210	--	STEEL	-- - --		86-57-42		HOME
0064SW 1	11900264	JONES H	06/16/1966	266	5	32		GOOD	35-36-20	S	00120
MAURY			/ /	235	25	STEEL	-- - --		86-58-18		OTHR
0064SW 1	11900454	HUCKABY L	04/10/1970	80	3	21		GOOD	35-36-45	S	00058
MAURY			/ /	48	4	STEEL	-- - --		86-59-51		TEST
0064SW 1	11900472	FAUTT M	07/24/1969	300	1	21		GOOD	35-36-33	S	00015
MAURY			/ /	215	140	STEEL	-- - --		86-58-04		HOME
0064SW 1	11909045	J C LOFTIN	/ /19	--	--	--			35-35-23	S	
MAURY			/ /	--	--		-- - --		86-59-44		FARM
0064SW 1	11909046	CHARLES W STOFEL	/ /19	--	--	--			35-35-21	S	
MAURY			/ /	--	--		-- - --		86-59-33		OTHR
0064SW 1	11909054	DAISY DEAN	/ /19	--	--	--			35-35-20	S	
MAURY			/ /	--	8		-- - --		86-59-33		OTHR

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 1	11909057	ALTON LYNN	/ /19	--	--	--			35-35-23	S	
MAURY			/ /	--	98		-- - --		86-58-48		HOME
0064SW 1	11909058	H M TANKERSLEY	/ /19	--	--	--			35-35-18	S	
MAURY			/ /	--	--		-- - --		86-58-22		OTHR
0064SW 1	11909059	JIMMIE MCCORMACK	/ /19	--	--	--			35-36-32	S	
MAURY			/ /	--	--		-- - --		86-58-35		HOME
0064SW 1	11909060		/ /19	--	--	--			35-36-17	S	
MAURY			/ /	--	219		-- - --		86-59-05		FARM
0064SW 1	11909061	ROY ALEXANDER JR	/ /19	--	--	--			35-36-19	S	
MAURY			/ /	--	37		-- - --		86-59-22		HOME
0064SW 1	11909070	EARL P CHEEK	/ /19	--	--	--			35-35-28	S	
MAURY			/ /	--	--		-- - --		86-59-23		OTHR
0064SW 1	11909072	WILLIAM H CONNER	/ /19	--	--	--			35-35-42	S	
MAURY			/ /	--	--		-- - --		86-57-28		HOME
0064SW 2	11900024	CONNELLY J	12/16/1963	260	30	140		GOOD	35-35-49	S	00057
MAURY			/ /	244	112	STEEL	-- - --		86-56-53		HOME
0064SW 2	11900064	COTHRAS C	04/27/1964	170	3	19		GOOD	35-35-51	S	00120
MAURY			/ /	135	65	STEEL	-- - --		86-57-16		HOME
0064SW 2	11900102	PRIMM N	10/10/1964	185	22	10		GOOD	35-35-48	S	00100
MAURY			/ /	120	80	STEEL	-- - --		86-56-48		HOME
0064SW 2	11900121	FINSLEY J	10/04/1964	850	2	12		GOOD	35-35-34	S	00120
MAURY			/ /	850	211	STEEL	-- - --		86-57-20		HOME
0064SW 2	11900208	KINGER J	10/30/1965	163	30	54		GOOD	35-37-24	S	
MAURY			/ /	155	--	STEEL	-- - --		86-55-21		OTHR
0064SW 2	11900265	THORN K	06/18/1966	110	1	15		GOOD	35-37-25	S	00120
MAURY			/ /	70	22	STEEL	-- - --		86-56-45		HOME
0064SW 2	11900442	MILLER W	03/31/1969	1050	2	22			35-35-17	S	00120
MAURY			/ /	900	158	STEEL	-- - --		86-57-42		HOME
0064SW 2	11900547	HUCKABY H D	05/18/1971	105	2	21		GOOD	35-35-42	S	00453
MAURY			/ /	50	22	STEEL	-- - --		86-55-37		HOME
0064SW 2	11900563	PRIMM J	07/21/1971	1040	1	25		GOOD	35-35-06	S	00120
MAURY			/ /	995	55		-- - --		86-56-02		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) CN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 2	11900568	DUGGER B	06/01/1971	320	--	21		GOOD	35-36-42	S	00120
MAURY			/ /	75	13	STEEL	-- - --		86-56-30		FARM
0064SW 2	11909062	HERBERT LUNN	/ /19	--	--	--			35-35-51	S	
MAURY			/ /	--	108		-- - --		86-57-14		HOME
0064SW 2	11909063	J A LOFTIN	/ /19	--	--	--			35-36-05	S	
MAURY			/ /	--	--		-- - --		86-57-10		HOME
0064SW 2	11909064	IRVIN L CORDER	/ /19	--	--	--			35-36-08	S	
MAURY			/ /	--	--		-- - --		86-56-54		HOME
0064SW 2	11909065	LAVON HOOIE	/ /19	--	--	--			35-36-24	S	
MAURY			/ /	--	--		-- - --		86-57-22		FARM
0064SW 2	11909069	ALFRED J THOMAS	/ /19	--	--	--			35-36-20	S	
MAURY			/ /	--	126		-- - --		86-57-08		HOME
0064SW 2	11909105	JACK W JONES	/ /19	--	--	--			35-35-12	S	
MAURY			/ /	--	3		-- - --		86-56-20		OTHR
0064SW 2	11909106	JASPER LEE	/ /19	--	--	--			35-35-11	S	
MAURY			/ /	--	81		-- - --		86-56-22		HOME
0064SW 2	11909107	MONROE PRIMM	/ /19	--	--	--			35-35-12	S	
MAURY			/ /	--	37		-- - --		86-56-10		OTHR
0064SW 2	11909108	FRANK HARRIS	/ /19	--	--	--			35-35-49	S	
MAURY			/ /	--	--		-- - --		86-56-28		HOME
0064SW 2	11909109	DOROTHY LUNN	/ /19	--	--	--			35-36-05	S	
MAURY			/ /	--	--		-- - --		86-56-46		HOME
0064SW 2	91002960	ANDERSON_____GARY	07/24/1991	150	8	21	OPEN	H2S	- -		00330
MAURY		UNION BEND	/ /	138	25	OTHER	21 - 150		- -	Y	HOME
0064SW 2	92001986	THOMPSON_____BOB	06/02/1992	300	0	20	OPEN	OTHR	- -		00120
MAURY		CRANFORD HOLLOW	/ /	--	0	OTHER	20 - 300		- -	Y	HOME
0064SW 2	92002956	THOMPSON_____ROBE	06/07/1992	1075	8	22	OPEN	H2S	- -		00330
MAURY		CRANFORD	/ /	1025	225	OTHER	22 - 1075		- -	Y	HOME
0064SW 3	11900011	RUMMAGE J	09/07/1963	108	32	11		GOOD	35-37-25	S	00057
MAURY			/ /	85	80	STEEL	-- - --		86-54-00		HOME
0064SW 3	11900087	HARDISON	07/01/19	168	20	12		GOOD	35-35-00	S	00100
MAURY			/ /	160	74	STEEL	-- - --		86-53-23		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE SLEITAUT QUADRANGLE [illegible]SW IN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 3 MAURY	11900186	SHANNON E	07/27/1965 / /	105 100	4 58	13 STEEL	-- - --		35-36-58 86-54-34	S	00120 HOME
0064SW 3 MAURY	11901139	WATTERS_____GARY SHAYS	01/14/1986 / /	200 --	0 --	20 OTHER	OPEN 20 - 200	OTHR	- - - -	Y	00330 HOME
0064SW 3 MAURY	11901140	WATTERS_____GARY SHAYS	01/14/1986 / /	160 --	0 --	20 OTHER	OPEN 20 - 160	OTHR	- - - -	Y	00330 HOME
0064SW 3 MAURY	11901146	CLIFTON_____IRMA CARPENTER BRIDG	03/31/1986 / /	300 220	1 50	20 OTHER	OPEN 20 - 300	FAIR	- - - -	Y	00330 HOME
0064SW 3 MAURY	11909115	THOMAS H PEEBLES	/ /19 / /	-- --	-- 5	-- 	-- - --		35-35-29 86-53-30	S	 OTHR
0064SW 3 MAURY	11909116	J C WILLIAMS	/ /19 / /	-- --	-- --	-- 	-- - --		35-35-25 86-54-26	S	 HOME
0064SW 3 MAURY	11909117	ARTHUR WENTZEL	/ /19 / /	-- --	-- --	-- 	-- - --		35-35-27 86-54-27	S	 HOME
0064SW 3 MAURY	11909118	R B WILLIAMS	/ /19 / /	-- --	-- --	-- 	-- - --		35-35-27 86-54-35	S	 HOME
0064SW 3 MAURY	11909119	CARL PILKINTON	/ /19 / /	-- --	-- 23	-- 	-- - --		35-35-32 86-54-46	S	 OTHR
0064SW 3 MAURY	11909120	CARL PILKINTON	/ /19 / /	-- --	-- 24	-- 	-- - --		35-35-46 86-54-27	S	 OTHR
0064SW 3 MAURY	11909133	MARSHELL HARDISON	/ /19 / /	-- --	-- 18	-- 	-- - --		35-36-52 86-53-13	S	 HOME
0064SW 3 MAURY	11909141	CLYDE YORK	/ /19 / /	-- --	-- 92	-- 	-- - --		35-36-03 86-53-18	S	 OTHR
0064SW 3 MAURY	91000031	GULHAN_____J_W_ SOWELL MILL PK	09/26/1990 / /	650 640	15 --	20 OTHER	OPEN -- - --	GOOD	- - - -	Y	00120 HOME
0064SW 4 MAURY	11900008	GIBSON E	09/19/1963 / /	100 70	15 25	10 STEEL	-- - --	GOOD	35-33-54 86-58-37	S	00120 HOME
0064SW 4 MAURY	11900045	SCOTT M	01/27/1964 / /	800 795	2 22	65 STEEL	-- - --	GOOD	35-33-06 86-59-29	S	00120 HOME
0064SW 4 MAURY	11900052	SWAFFORD J	03/09/1964 / /	105 50	30 22	22 STEEL	-- - --	GOOD	35-32-37 86-57-42	S	00120 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 4	11900070	LYNN C	03/19/1964	73	25	6		GOOD	35-34-13	S	00120
MAURY			/ /	35	18	STEEL	-- - --		86-59-52		FARM
0064SW 4	11900161	MOORE C	06/02/1965	798	1	27		GOOD	35-33-10	S	00058
MAURY			/ /	790	60	STEEL	-- - --		86-59-30		HOME
0064SW 4	11900185	PURYEAR H	/ /19	150	1	14		GOOD	35-32-40	S	00120
MAURY			/ /	50	10	STEEL	-- - --		86-57-14		HOME
0064SW 4	11900197	MOORE H	09/06/1965	164	20	13		BAD	35-32-34	S	00058
MAURY			/ /	160	40	STEEL	-- - --		86-59-03		HOME
0064SW 4	11900217	KILPATRICK MARGRET	01/10/1966	755	5	16		BAD	35-33-30	S	00058
MAURY			/ /	750	40	STEEL	-- - --		86-59-00		HOME
0064SW 4	11900262	MCKEE G	03/31/1966	70	30	23		GOOD	35-42-31	S	00120
MAURY			/ /	35	30	STEEL	-- - --		86-57-39		HOME
0064SW 4	11900861	CRAIG J.	08/26/1976	425	1	84		BAD	- -		00120
MAURY			/ /	350	50	STEEL	-- - --		- -		HOME
0064SW 4	11901251	BUNKER_____FLOY	07/16/1988	375	0	35	OPEN	OTHR	- -		00640
MAURY		DIXON	/ /	--	--	OTHER	35 - 375		- -	Y	HOME
0064SW 4	11909001	CECIL UPSHAW	/ /19	--	--	--			35-33-16	S	
MAURY			/ /	--	--		-- - --		86-58-58		HOME
0064SW 4	11909002	WILLIAM L THOMAS	/ /19	--	--	--			35-33-04	S	
MAURY			/ /	--	--		-- - --		86-58-00		HOME
0064SW 4	11909011	LEE D ESTES	/ /19	--	--	--			35-32-33	S	
MAURY			/ /	--	--		-- - --		86-59-22		HOME
0064SW 4	11909014	THOMAS R TATE	/ /19	--	--	--			35-32-31	S	
MAURY			/ /	--	35		-- - --		86-59-13		HOME
0064SW 4	11909017	HARDIN VOSS	/ /19	--	--	--			35-32-02	S	
MAURY			/ /	--	--		-- - --		86-59-50		HOME
0064SW 4	11909020	C W DILLEHAY	/ /19	--	--	--			35-32-16	S	
MAURY			/ /	--	5		-- - --		86-59-14		OTHR
0064SW 4	11909021	CHARLES E HARGROVE	/ /19	--	--	--			35-33-14	S	
MAURY			/ /	--	--		-- - --		86-59-43		HOME
0064SW 4	11909029	C H WEAVER	/ /19	--	--	--			35-33-51	S	
MAURY			/ /	--	38		-- - --		86-59-42		OTHR

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW), TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 4	11909030	R H BROADWAY	/ /19	--	--	--			35-34-02	S	
MAURY			/ /	--	--		-- - --		86-59-40		OTHR
0064SW 4	11909034	CARL THOMAS CRAIN	/ /19	--	--	--			35-34-14	S	
MAURY			/ /	--	43		-- - --		87-00-00		HOME
0064SW 4	11909035	DAVID LOVETT	/ /19	--	--	--			35-34-17	S	
MAURY			/ /	--	21		-- - --		86-59-55		HOME
0064SW 4	11909038	HAROLD G LANDERS	/ /19	--	--	--			35-33-40	S	
MAURY			/ /	--	--		-- - --		86-58-36		HOME
0064SW 4	11909039	HELEN MOORE LANDERS	/ /19	--	--	--			35-33-29	S	
MAURY			/ /	--	--		-- - --		86-58-28		HOME
0064SW 4	11909040	PEARL J HARRIS	/ /19	--	--	--			35-33-32	S	
MAURY			/ /	--	--		-- - --		86-59-20		OTHR
0064SW 4	11909041	PEARL J HARRIS	/ /19	--	--	--			35-33-28	S	
MAURY			/ /	--	3		-- - --		86-59-24		OTHR
0064SW 4	11909042		/ /19	--	--	--			35-33-23	S	
MAURY			/ /	--	--		-- - --		86-58-40		HOME
0064SW 4	11909043	MARTIN D PARRISH	/ /19	--	--	--			35-34-21	S	
MAURY			/ /	--	25		-- - --		86-59-30		OTHR
0064SW 4	11909052	ROBERT A PARRISH	/ /19	--	--	--			35-34-32	S	
MAURY			/ /	--	60		-- - --		86-59-35		HOME
0064SW 4	11909053	R L VAUGHANS HEIRS	/ /19	--	--	--			35-34-56	S	
MAURY			/ /	--	14		-- - --		86-59-16		OTHR
0064SW 4	11909067	NETTIE RIEVES NIX	/ /19	--	--	--			35-34-33	S	
MAURY			/ /	--	8		-- - --		86-57-47		OTHR
0064SW 4	11909073	H B SLOAN	/ /19	--	--	--			35-33-41	S	
MAURY			/ /	--	42		-- - --		86-58-19		HOME
0064SW 4	11909074	EUGENE WILSON	/ /19	--	--	--			35-34-23	S	
MAURY			/ /	--	24		-- - --		86-59-36		HOME
0064SW 4	11909075	ROBERT MCKINZIE	/ /19	--	--	--			35-34-18	S	
MAURY			/ /	--	24		-- - --		86-59-16		HOME
0064SW 4	11909078	DAVID M CRAIG	/ /19	--	--	--			35-32-52	S	
MAURY			/ /	--	--		-- - --		86-57-32		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 4 MAURY	11909088	DAVID M CHEEK	/ /19 / /	-- --	-- 25	-- 	-- - --		35-32-39 86-57-51	S	 HOME
0064SW 4 MAURY	91003926	DUCK RIVER AGENCY MOORE	08/30/1991 / /	1009 910	5 --	32 STEEL	OPEN 32 - 1009	GOOD	- - - -	 Y	00015 HOME
0064SW 4 MAURY	92003258	HASKINS_____RICK VOSS RD	07/08/1992 / /	145 143	8 23	20 OTHER	OPEN 20 - 145	GOOD	- - - -	 Y	00120 HOME
0064SW 4 MAURY	93001307	KEELE_____LARR HWY 50	03/17/1993 / /	700 695	10 60	20 OTHER	OPEN 20 - 700	GOOD	- - - -	 Y	00120 HOME
0064SW 5 MAURY	11900246	WORLEY C	09/29/1966 / /	802 800	3 86	21 STEEL	-- - --	BAD	35-32-42 86-56-08	S	00058 HOME
0064SW 5 MAURY	11900257	BRYANT E	01/25/1967 / /	158 65	-- 29	27 STEEL	-- - --	GOOD	35-32-32 86-57-10	S	00058 HOME
0064SW 5 MAURY	11900367	PERKS M	07/11/1967 / /	800 795	1 --	21 STEEL	-- - --	GOOD	35-32-46 86-55-41	S	00120 HOME
0064SW 5 MAURY	11900368	BASHEARS S	07/13/1967 / /	250 95	-- 63	23 STEEL	-- - --	GOOD	35-32-40 86-55-41	S	00120 HOME
0064SW 5 MAURY	11900413	JOHNSON C	07/09/1965 / /	885 860	3 38	36 STEEL	-- - --		35-34-58 86-56-28	S	00120 HOME
0064SW 5 MAURY	11900867	INGRAM T.	09/25/1976 / /	300 70	1 60	42 STEEL	-- - --	BAD	35-33-14 86-57-08	S	00120 HOME
0064SW 5 MAURY	11900985	CUSHING J	03/18/1980 / /	125 80	100 --	95 STEEL	-- - --	GOOD	35-33-26 86-55-12	S	00120 HOME
0064SW 5 MAURY	11900986	HARGROVE B	03/24/1980 / /	125 90	4 --	21 STEEL	-- - --	GOOD	35-33-32 86-55-14	S	00120 HOME
0064SW 5 MAURY	11901088	CORLEY_____JIM BRYANT RD	08/22/1984 / /	920 800	3 --	20 OTHER	OPEN 20 - 920	FAIR	- - - -	 Y	00120 HOME
0064SW 5 MAURY	11901148	COOPER_____WILL NEGRO CREEK	04/24/1986 / /	200 --	-- --	20 OTHER	OPEN 20 - 200	OTHR	- - - -	 Y	00640 HOME
0064SW 5 MAURY	11901168	BAKER_____KEIT NEW CUT RD	12/18/1986 / /	1155 1120	7 350	20 OTHER	OPEN 20 - 1155	IRON	- - - -	 Y	00120 HOME
0064SW 5 MAURY	11901201	COOPER_____BILL NEGRO CREEK	05/13/1987 / /	125 23	11 50	20 OTHER	OPEN 24 - 125	FAIR	- - - -	 Y	00120 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) TN

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 5 MAURY	11901303	HARGROVE___ ____BILL HOWARD BRIDGE R	09/28/1989 / /	250 0	1 80	20 STEEL	OPEN 20 - 250	GOOD	- - - -	 Y	00330 HOME
0064SW 5 MAURY	11909066	C E HARLAN	/ /19 / /	-- --	-- --	--	-- - --		35-34-36 86-57-20	S	HOME
0064SW 5 MAURY	11909068	EMMITT YOUNG	/ /19 / /	-- --	-- 65	--	-- - --		35-33-06 86-56-19	S	OTHR
0064SW 5 MAURY	11909071	ANDREW D BENEFIELD	/ /19 / /	-- --	-- 48	--	-- - --		35-33-18 86-56-48	S	HOME
0064SW 5 MAURY	11909076	J W MATTHEWS	/ /19 / /	-- --	-- 106	--	-- - --		35-32-49 86-57-20	S	HOME
0064SW 5 MAURY	11909077	CARTHAL VAUGHN	/ /19 / /	-- --	-- 20	--	-- - --		35-32-43 86-56-16	S	HOME
0064SW 5 MAURY	11909079	HAZEL E CAREY	/ /19 / /	-- --	-- 45	--	-- - --		35-32-32 86-57-04	S	OTHR
0064SW 5 MAURY	11909084	NG DAVIDSON	/ /19 / /	-- --	-- 12	--	-- - --		35-32-46 86-56-39	S	OTHR
0064SW 5 MAURY	11909086	MRS HUEY T HOLLOWAY	/ /19 / /	-- --	-- 8	--	-- - --		35-32-36 86-56-36	S	HOME
0064SW 5 MAURY	11909087	CYNTHIA L DAVIDSON	/ /19 / /	-- --	-- 52	--	-- - --		35-33-03 86-56-22	S	HOME
0064SW 5 MAURY	11909089	AUBREY SMITHSON	/ /19 / /	-- --	-- 79	--	-- - --		35-33-23 86-55-02	S	HOME
0064SW 5 MAURY	11909091	MICHAEL PERKO	/ /19 / /	-- --	-- 40	--	-- - --		35-33-13 86-55-41	S	OTHR
0064SW 5 MAURY	11909096	T E DERRYBERRY	/ /19 / /	-- --	-- --	--	-- - --		35-34-05 86-55-18	S	HOME
0064SW 5 MAURY	11909097	CAMERON H MCKAY	/ /19 / /	-- --	-- 11	--	-- - --		35-33-41 86-55-36	S	OTHR
0064SW 5 MAURY	11909099	N MONROE PRIMM	/ /19 / /	-- --	-- 46	--	-- - --		35-34-33 86-55-03	S	OTHR
0064SW 5 MAURY	11909102	EARL P CHEEK	/ /19 / /	-- --	-- --	--	-- - --		35-34-52 86-55-28	S	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL LAB NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 5 MAURY	11909103	CECIL JOHNSON	/ /19 / /	-- --	-- 19	-- 	 -- - --		35-34-53 86-56-30	S 	 OTHR
0064SW 5 MAURY	11909104	J C CHEEK	/ /19 / /	-- --	-- 67	-- 	 -- - --		35-34-57 86-55-55	S 	 OTHR
0064SW 5 MAURY	91000936	DAVIS_____KING PRESSNELL	03/06/1991 / /	850 775	8 60	34 OTHER	OPEN 34 - 850	H2S	- - - -	 Y	00330 HOME
0064SW 5 MAURY	92002831	ANDREWS_____BILL SOWELL RD	06/15/1992 / /	804 780	6 --	63 STEEL	OPEN 63 - 804	GOOD	- - - -	 Y	00015 HOME
0064SW 6 MAURY	11900023	HARTY D	12/05/1963 / /	120 66	4 48	38 STEEL	 -- - --	GOOD	35-33-31 86-54-48	S 	00057 HOME
0064SW 6 MAURY	11900324	PRIMM J	07/14/1967 / /	150 125	6 43	21 STEEL	 -- - --	GOOD	35-34-46 86-54-41	S 	00120 HOME
0064SW 6 MAURY	11900534	ENGLAND G	04/18/1970 / /	185 50	1 --	37 	 -- - --		35-34-04 86-52-46	S 	00120 HOME
0064SW 6 MAURY	11901196	LEATHERWOOD____EDDI TVA	08/21/1987 04/22/1988	145 23	6 --	20 OTHER	OPEN 20 - 145	GOOD	35-34-30 86-54-30	M Y	00120 HOME
0064SW 6 MAURY	11909090	CARLES G YOUNG	/ /19 / /	-- --	-- 89	-- 	 -- - --		35-33-19 86-54-43	S 	 HOME
0064SW 6 MAURY	11909092	CP CHEEK	/ /19 / /	-- --	-- 65	-- 	 -- - --		35-33-44 86-53-50	S 	 HOME
0064SW 6 MAURY	11909093	C P CHEEK	/ /19 / /	-- --	-- 20	-- 	 -- - --		35-33-35 86-54-16	S 	 OTHR
0064SW 6 MAURY	11909094	CLYDE MALPHUS	/ /19 / /	-- --	-- 50	-- 	 -- - --		35-33-05 86-54-35	S 	 OTHR
0064SW 6 MAURY	11909095	H N CHEEK	/ /19 / /	-- --	-- 53	-- 	 -- - --		35-34-06 86-54-57	S 	 OTHR
0064SW 6 MAURY	11909098	J T PRIMM	/ /19 / /	-- --	-- 13	-- 	 -- - --		35-34-35 86-54-48	S 	 OTHR
0064SW 6 MAURY	11909100	ERNEST WRIGHT	/ /19 / /	-- --	-- 30	-- 	 -- - --		35-34-29 86-54-55	S 	 OTHR
0064SW 6 MAURY	11909101	M REGEN CHUMBLEY	/ /19 / /	-- --	-- --	-- 	 -- - --		35-34-55 86-54-53	S 	 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW, TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 6 MAURY	11909110	DAISY DEAN	/ /19 / /	-- --	-- 64	-- 	 -- - --		35-32-35 86-54-11	S	 HOME
0064SW 6 MAURY	11909111	LUKE MOSER	/ /19 / /	-- --	-- --	-- 	 -- - --		35-32-49 86-52-59	S	 HOME
0064SW 6 MAURY	11909112	LUKE MOSER	/ /19 / /	-- --	-- 35	-- 	 -- - --		35-32-47 86-53-02	S	 OTHR
0064SW 6 MAURY	11909114	A E SANDERS	/ /19 / /	-- --	-- 25	-- 	 -- - --		35-33-06 86-52-35	S	 OTHR
0064SW 6 MAURY	11909129	DIXIE FERGURSON	/ /19 / /	-- --	-- 130	-- 	 -- - --		35-34-07 86-53-06	S	 HOME
0064SW 6 MAURY	11909130	W H THOMLINSON	/ /19 / /	-- --	-- 60	-- 	 -- - --		35-34-10 86-52-57	S	 HOME
0064SW 6 MAURY	11909131	PRESTON CARROLL	/ /19 / /	-- --	-- 25	-- 	 -- - --		35-34-33 86-53-02	S	 HOME
0064SW 6 MAURY	11909165	A D LIGGETT	/ /19 / /	-- --	-- 110	-- 	 -- - --		35-33-45 86-53-18	S	 HOME
0064SW 6 MAURY	90001642	GILLIAM_____RICH SOWELL MILL PIK	05/30/1990 / /	205 200	50 12	28 OTHER	OPEN 28 - 205	GOOD	- - - -	 Y	00640 HOME
0064SW 6 MAURY	90002052	BOSTWICK_____DANI SOWELL MILL PK	05/07/1990 / /	250 148	8 5	66 OTHER	OPEN 66 - 250	GOOD	- - - -	 Y	00640 HOME
0064SW 6 MAURY	91000053	BROWN_____STEV NEW CUT RD	11/26/1990 / /	275 125	2 93	20 OTHER	OPEN 20 - 275	GOOD	- - - -	 Y	00120 HOME
0064SW 6 MAURY	92003851	PARKS DEVELOPMENT C HOUSTON CHEEK	05/04/1992 / /	225 --	0 54	20 OTHER	OPEN 20 - 225	GOOD	- - - -	 Y	00120 HOME
0064SW 7 MAURY	11900153	WILSON B	01/28/1965 / /	779 775	3 90	15 STEEL	 -- - --		35-30-58 86-59-32	S	00120 HOME
0064SW 7 MAURY	11901056	TROOP WILL DENTON	6/14/1983 / /	740 715	3 10	21 STEEL	 21 - 740	GOOD	- - - -	 Y	00103
0064SW 7 MAURY	11901058	ADAMS BOBB BRUSH CREEK	7/11/1983 / /	160 145	4 20	21 STEEL	 21 - 160	GOOD	- - - -	 Y	00613
0064SW 7 MAURY	11901176	ESTES_____SIDN 	08/18/1986 / /	825 815	3 100	20 OTHER	OPEN 20 - 825	GOOD	- - - -	 N	00018 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ	TOT YIELD DEPTH STAT	CSE DEPTH LEVEL CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 7	11901191	GREGORY_____LONN	08/14/1987	350	--	29	OPEN	FAIR	- -		00015
MAURY		TOBE ROBERSON	/ /	--	--	STEEL	29 - 350		- -	Y	HOME
0064SW 7	11909003	LUTHER N LAMAR	/ /19	--	--	--			35-32-13	S	
MAURY			/ /	--	47		-- - --		86-58-00		HOME
0064SW 7	11909004	HARRY W MITCHELL	/ /19	--	--	--			35-32-28	S	
MAURY			/ /	--	--		-- - --		86-58-17		OTHR
0064SW 7	11909005	HARRY W MITCHELL	/ /19	--	--	--			35-32-28	S	
MAURY			/ /	--	--		-- - --		86-58-18		OTHR
0064SW 7	11909006	ANNIE RUTH CLARK	/ /19	--	--	--			35-32-24	S	
MAURY			/ /	--	--		-- - --		86-58-29		OTHR
0064SW 7	11909008	HARRY W MITCHELL	/ /19	--	--	--			35-32-20	S	
MAURY			/ /	--	54		-- - --		86-58-17		OTHR
0064SW 7	11909009	RAY MOORES HEIRS	/ /19	--	--	--			35-32-13	S	
MAURY			/ /	--	4		-- - --		86-58-51		OTHR
0064SW 7	11909010	ANNIE RUTH CLARK	/ /19	--	--	--			35-32-22	S	
MAURY			/ /	--	3		-- - --		86-58-43		OTHR
0064SW 7	11909012	MARY DENTON CATHEY	/ /19	--	--	--			35-32-24	S	
MAURY			/ /	--	--		-- - --		86-59-16		HOME
0064SW 7	11909013	MARY DENTON CATHEY	/ /19	--	--	--			35-32-27	S	
MAURY			/ /	--	13		-- - --		86-59-21		OTHR
0064SW 7	11909015	MARY DENTON CATHEY	/ /19	--	--	--			35-32-25	S	
MAURY			/ /	--	34		-- - --		86-59-26		HOME
0064SW 7	11909016	DAVID THOMASON	/ /19	--	--	--			35-32-27	S	
MAURY			/ /	--	24		-- - --		86-59-30		HOME
0064SW 7	11909018	MARY CHALES MITCHEL	/ /19	--	--	--			35-32-02	S	
MAURY			/ /	--	--		-- - --		86-59-05		OTHR
0064SW 7	11909019	MARY DENTON CATHEY	/ /19	--	--	--			35-32-25	S	
MAURY			/ /	--	--		-- - --		86-59-35		OTHR
0064SW 7	11909022	HENRY PAYNE	/ /19	--	--	--			35-31-51	S	
MAURY			/ /	--	76		-- - --		86-58-06		HOME
0064SW 7	11909023	LESLIE EDDLEMAN	/ /19	--	--	--			35-31-37	S	
MAURY			/ /	--	--		-- - --		86-58-27		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0064SW 7 MAURY	11909024	H H HIGHT HEIRS	/ /19 / /	-- --	-- 39	-- 	 -- - --		35-31-36 86-58-23	S 	 OTHR
0064SW 7 MAURY	11909025	THOMAS SHARP	/ /19 / /	-- --	-- --	-- 	 -- - --		35-31-40 86-58-01	S 	 HOME
0064SW 7 MAURY	11909026	ELLIS DUGGER	/ /19 / /	-- --	-- --	-- 	 -- - --		35-30-48 86-57-54	S 	 HOME
0064SW 7 MAURY	11909027	ELLIS DUGGER	/ /19 / /	-- --	-- 25	-- 	 -- - --		- - - -	 	 HOME
0064SW 7 MAURY	11909028	JOHN W FINNEYS HEIR	/ /19 / /	-- --	-- --	-- 	 -- - --		35-32-07 86-58-48	S 	 HOME
0064SW 7 MAURY	11909031	ROBERT S HARDISON	/ /19 / /	-- --	-- 34	-- 	 -- - --		35-31-31 86-57-31	S 	 OTHR
0064SW 7 MAURY	11909032	ROBERT S HARDISON	/ /19 / /	-- --	-- --	-- 	 -- - --		35-31-31 86-57-29	S 	 HOME
0064SW 7 MAURY	90000194	KALMANEK_____RICH GLENCOE	10/02/1989 / /	165 165	8 --	53 STEEL	OPEN 53 - 165	GOOD	- - - -	 Y	00015 HOME
0064SW 7 MAURY	90000195	KALMANEK_____RICH GLENCOE	10/03/1989 / /	150 85	75 --	20 STEEL	OPEN 20 - 150	UNK	- - - -	 Y	00015 HEAT
0064SW 7 MAURY	92003704	LOOPER_____MIKE GREASY BRANCH	08/18/1992 / /	250 150	4 80	63 OTHER	OPEN 63 - 250	GOOD	- - - -	 Y	00330 HOME
0064SW 7 MAURY	93000097	LOOPER_____MIKE GREASY BRANCH	12/08/1992 / /	300 120	2 25	20 OTHER	OPEN 20 - 300	GOOD	- - - -	 Y	00330 HOME
0064SW 7 MAURY	93003946	LOVELL_____RONA	09/14/1993 / /	130 --	0 --	-- OTHER	 -- - --	OTHR	- - - -	 Y	00120 HOME
0064SW 8 MAURY	11900088	CHEEK C	07/10/1964 / /	75 40	5 17	6 STEEL	 -- - --	GOOD	35-31-42 86-55-24	S 	00100 HOME
0064SW 8 MAURY	11900141	DILLEHAY O	01/20/1965 / /	100 68	8 76	35 STEEL	 -- - --	GOOD	35-31-00 86-55-24	S 	00057 HOME
0064SW 8 MAURY	11900195	WHITAKER H	09/12/1965 / /	89 75	10 39	8 STEEL	 -- - --	BAD	35-32-20 86-55-17	S 	00058 HOME
0064SW 8 MAURY	11900218	STONE J	01/19/1966 / /	190 180	10 70	70 STEEL	 -- - --	GOOD	35-31-40 86-56-35	S 	00058 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
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0064SW 8 MAURY	11900226	VAUGHN P	05/01/1966 / /	70 45	6 30	16 STEEL	-- - --	GOOD	35-30-07 86-56-37	S	00252 HOME
0064SW 8 MAURY	11900336	BILLINGLEY V	08/18/1967 / /	110 85	50 46	23 STEEL	-- - --	GOOD	35-31-20 86-55-05	S	00120 HOME
0064SW 8 MAURY	11900349	CRUMLEY A	08/11/1967 / /	230 80	1 85	40 STEEL	-- - --		35-31-35 86-54-57	S	00120 HOME
0064SW 8 MAURY	11900452	MITCHELL A.	10/04/1973 / /	200 25	1 58	21 STEEL	-- - --	GOOD	35-32-05 86-55-20	S	00120 HOME
0064SW 8 MAURY	11900499	FINNENGAN DIXIE	09/19/1970 / /	275 252	2 84	20 STEEL	-- - --	GOOD	35-32-03 86-56-42	S	00453 HOME
0064SW 8 MAURY	11900575	LANDERS W	02/25/1971 / /	200 185	8 102	128 STEEL	-- - --	GOOD	35-32-17 86-57-22	S	00120 FARM
0064SW 8 MAURY	11900625	CRAIG F	02/07/1972 / /	160 140	-- 23	20 STEEL	-- - --	GOOD	35-31-07 86-56-23	S	00058 HOME
0064SW 8 MAURY	11900627	MCCULLIN J B	02/11/1972 / /	842 835	2 55	25 STEEL	-- - --	BAD	35-30-30 86-56-35	S	00058 HOME
0064SW 8 MAURY	11901045	LAMAR LUTH HWY 50	2/22/1983 / /	40 22	10 0	20 STEEL	20 - 40	GOOD	- - - -	Y	00103
0064SW 8 MAURY	11901046	LAMAR LUTH HWY 50	2/25/1983 / /	205 0	0 0	21 STEEL	21 - 205		- - - -	Y	00103
0064SW 8 MAURY	11901047	LAMAR LUTH HWY 50	2/28/1983 / /	245 0	0	21 STEEL	21 - 245	OTHR	- - - -	Y	00103
0064SW 8 MAURY	11901159	HENSON_____LILL SMITH	09/15/1986 / /	160 138	15 40	42 OTHER	OPEN 42 - 160	GOOD	- - - -	Y	00269 HOME
0064SW 8 MAURY	11901207	PILKTON_____DAVI SMITH ACRES	07/30/1987 / /	100 85	20 18	20 OTHER	OPEN 20 - 100	GOOD	- - - -	Y	00330 HOME
0064SW 8 MAURY	11901242	FALCONBURY_____JEFF CULLOOKA	09/10/1988 / /	300 125	0 30	20 OTHER	OPEN 20 - 300	GOOD	- - - -	Y	00330 HOME
0064SW 8 MAURY	11909080	MRS ED WALKER	/ /19 / /	-- --	-- 23	--	-- - --		35-32-18 86-57-12	S	HOME
0064SW 8 MAURY	11909081	ALTON WALKER	/ /19 / /	-- --	-- 78	--	-- - --		35-32-24 86-57-17	S	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
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0064SW 8 MAURY	11909082	HARDIN LIGGETT	/ /19 / /	-- --	-- 26	-- 	 -- - --	 	35-32-00 86-55-54	S 	 HOME
0064SW 8 MAURY	11909083	DELLA RUBERT	/ /19 / /	-- --	-- 18	-- 	 -- - --	 	35-31-55 86-55-41	S 	 HOME
0064SW 8 MAURY	11909125	MRS R L MURPHY	/ /19 / /	-- --	-- --	-- 	 -- - --	 	35-30-18 86-57-15	S 	 FARM
0064SW 8 MAURY	11909126	PERSIA OSBORNE	/ /19 / /	-- --	-- 12	-- 	 -- - --	 	35-30-20 86-56-55	S 	 HOME
0064SW 8 MAURY	11909127	CAROLYN C STARLING	/ /19 / /	-- --	-- 13	-- 	 -- - --	 	35-30-18 86-57-09	S 	 HOME
0064SW 8 MAURY	91001566	FALCONBURY_____JEFF PARK STATION	04/16/1991 / /	825 780	4 60	30 OTHER	OPEN 30 - 825	H2S 	- - - -	 Y	00330 HOME
0064SW 8 MAURY	92001125	WILDERNESS SCHOOL N B KERR RD	11/18/1991 / /	175 75	10 6	20 OTHER	OPEN 20 - 175	GOOD 	- - - -	 Y	00120 COMM
0064SW 8 MAURY	92001126	NAT TR GROUP HOME 2513B KERR RD	10/28/1991 / /	85 35	45 8	20 OTHER	OPEN 20 - 85	GOOD 	- - - -	 Y	00120 COMM
0064SW 8 MAURY	92001127	NAT TR GROUP HOME 2513B KERR RD	10/23/1991 / /	125 --	0 --	-- OTHER	 -- - --	OTHR 	- - - -	 Y	00120 COMM
0064SW 8 MAURY	92003260	NAT TR GROUP HOME 2513 B KERR RD	08/07/1992 / /	1630 1630	14 65	20 OTHER	OPEN 20 - 1630	GOOD 	- - - -	 Y	00120 HOME
0064SW 9 MAURY	11900015	MOORE C	10/11/1963 / /	56 41	4 26	15 STEEL	 -- - --	GOOD 	35-31-35 86-54-55	S 	00057 HOME
0064SW 9 MAURY	11900046	LEDDBETTER M	02/06/1964 / /	836 815	3 85	13 STEEL	 -- - --	GOOD 	35-31-09 86-53-39	S 	00120 HOME
0064SW 9 MAURY	11900971	UZELL F	12/19/1979 / /	800 750	6 200	21 STEEL	 -- - --	BAD 	35-31-00 86-52-53	S 	00330 HOME
0064SW 9 MAURY	11901041	STONE EMME NEW CUT RD	3/15/1983 / /	307 128	1 	27 STEEL	 27 - 307	GOOD 	- - - -	 Y	00103
0064SW 9 MAURY	11901053	PREAS RONA SMYRNA CHURCH	12/22/1982 / /	160 135	10 60	50 STEEL	 50 - 160	GOOD 	- - - -	 Y	00613
0064SW 9 MAURY	11901054	WALSH BERN SMYRNA CHURCH	3/24/1983 / /	125 0	20 50	0 	 -	BAD 	- - - -	 N	00613

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE GLENDALE QUADRANGLE (0064SW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ	DEPTH	TOT YIELD STAT	LEVEL	CSE DEPTH CSE	TYPE	WELL FINISH INTERVAL		WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C	LOG	DRILLER USE
0064SW 9	11901055	WALSH BERN	3/24/1983	160		10		21				H2S	- -			00613
MAURY		SMYRNA CHURCH	/ /	140		20		STEEL		21 -	160		- -		Y	
0064SW 9	11901080	WORTHY RICK	04/16/1984	700		30		20		OPEN		GOOD	- -			00613
MAURY			/ /	645		50		OTHER		20 -	700		- -		Y	HOME
0064SW 9	11901121	JAMES RUEB	07/26/1985	80		7		22		SLOT		GOOD	- -			00330
MAURY		HWY 50	/ /	22		10		OTHER		22 -	27		- -		Y	HOME
0064SW 9	11901145	CLAYTON TIMO	02/04/1986	160		20		30		OPEN		GOOD	- -			00330
MAURY		OLD COLUMBIA	/ /	148		25		OTHER		30 -	160		- -		Y	HOME
0064SW 9	11901298	TAYLOR FRED	07/28/1989	--		15		34		OPEN		OTHR	- -			00227
MAURY			/ /	660		--		OTHER		-- -	--		- -		Y	HOME
0064SW 9	90001462	MORGAN GREG	04/12/1990	700		5		21		OPEN		H2S	- -			00330
MAURY		LUKE MOSER	/ /	660		10		OTHER		21 -	700		- -		Y	HOME
0064SW 9	92003208	GWYN PEND	07/16/1992	125		5		20		OPEN		GOOD	- -			00330
MAURY		GREEN FIELD EST	/ /	95		45		OTHER		20 -	125		- -		Y	HOME
0064SW 9	93004900	SHARPE JAME	10/28/1993	150		2		20		OPEN		H2S	- -			00330
MAURY		LUKE MOSER	/ /	73		45		OTHER		20 -	150		- -		Y	HOME
0064SW 9	93005117	DUNCAN GENE	11/10/1993	300		0		20		OPEN		OTHR	- -			00330
MAURY	D0002555	BRISTOW	/ /	--		--		OTHER		20 -	300		- -		Y	HOME
0064SW 9	94001935	RUBERT TODD	05/25/1994	150		11		20		OPEN		GOOD	- -			00330
MAURY	D0002613	SMYRNA CHURCH	/ /	130		--		OTHER		20 -	150		- -		Y	HOME
0064SW 9	94002829	GRIFFIS RUTH	07/12/1994	300		0		--				GOOD	- -			00330
MAURY	D0002640	BRIS TOW 2815	/ /	--		--		OTHER		0 -	300		- -		Y	HOME

REFERENCE NO. 16

1990 CPH-1-44

1990 Census of Population and Housing

Summary Population and Housing Characteristics

Tennessee

Issued August 1991

U.S. Department of Commerce
Robert A. Mosbacher, Secretary
Rockwell A. Schnabel, Deputy Secretary

Economics and Statistics Administration
Michael R. Darby, Under Secretary
for Economic Affairs and Administrator

BUREAU OF THE CENSUS
Barbara Everitt Bryant, Director

Table 6. Household, Family, and Group Quarters Characteristics: 1990

[For definitions of terms and meanings of symbols, see text]

State County Place and [In Selected States] County Subdivision	Persons in households	All households	Family households			Nonfamily households				Persons per—		Persons in group quarters		
							Householder living alone							
								65 years and over						
			Total	Married-couple family	Female householder, no husband present	Total	Total	Total	Female	Household	Family	Total	Institutionalized persons	Other persons in group quarters
The State	4 748 056	1 853 725	1 348 019	1 059 569	232 699	505 706	442 129	178 077	143 105	2.56	3.05	129 129	65 389	63 740
COUNTY														
Anderson County	67 595	27 384	19 846	16 181	2 958	7 538	6 911	3 117	2 547	2 47	2.96	655	578	77
Bedford County	30 031	11 608	8 768	7 087	1 289	2 840	2 536	1 290	1 017	2 59	3 01	380	343	37
Benton County	14 255	5 784	4 333	3 732	465	1 451	1 349	751	603	2 46	2.90	269	228	41
Bledsoe County	8 608	3 261	2 522	2 104	300	739	670	320	240	2 64	3 06	1 061	1 051	10
Blount County	84 463	33 624	25 344	21 284	3 237	8 280	7 400	3 267	2 661	2 51	2.94	1 506	1 044	462
Bradley County	72 043	27 604	21 157	17 518	2 841	6 447	5 714	2 277	1 826	2 61	3.02	1 669	539	1 130
Campbell County	34 783	13 150	10 158	8 036	1 702	2 992	2 789	1 496	1 192	2 65	3 07	296	285	11
Cannon County	10 356	3 980	3 035	2 574	351	945	872	470	375	2 60	3 03	111	111	-
Carroll County	26 860	10 727	8 013	6 612	1 092	2 714	2 531	1 435	1 148	2 50	2 95	654	388	266
Carter County	50 225	20 189	14 979	12 283	2 114	5 210	4 779	2 314	1 839	2 49	2.94	1 280	749	531
Cheatham County	26 840	9 515	7 748	6 679	776	1 767	1 524	587	436	2 82	3 15	300	180	120
Chester County	11 791	4 558	3 505	2 933	446	1 053	963	514	422	2.59	3.01	1 028	187	841
Claiborne County	25 533	9 629	7 579	6 266	1 007	2 050	1 910	935	772	2 65	3 05	604	210	394
Clay County	7 158	2 855	2 144	1 748	301	711	649	318	214	2 51	2 93	80	71	9
Cocke County	28 840	11 191	8 483	6 551	1 500	2 708	2 470	1 138	882	2 58	3 00	301	270	31
Coffee County	39 855	15 500	11 727	9 693	1 556	3 773	3 431	1 588	1 264	2 57	3 01	484	452	32
Crockett County	13 103	5 183	3 856	3 141	567	1 327	1 257	766	623	2 53	3 00	275	275	-
Cumberland County	34 207	13 426	10 451	8 842	1 265	2 975	2 688	1 299	1 026	2 55	2 92	529	529	-
Davidson County	489 689	207 530	131 395	95 592	29 555	76 135	62 830	18 268	14 969	2 36	2 97	21 095	10 317	10 778
Decatur County	10 330	4 216	3 109	2 603	391	1 107	1 032	607	461	2 45	2 91	142	142	-
DeKalb County	14 237	5 696	4 316	3 574	584	1 380	1 293	692	563	2 50	2 93	123	106	17
Dickson County	34 532	13 019	10 099	8 188	1 510	2 920	2 648	1 285	1 007	2 65	3 06	529	389	140
Dyer County	34 343	13 617	9 923	7 869	1 643	3 694	3 360	1 773	1 435	2 52	3 01	511	474	37
Fayette County	25 110	8 453	6 717	5 038	1 334	1 736	1 576	765	556	2 97	3 40	449	436	13
Fentress County	14 559	5 511	4 258	3 415	665	1 253	1 165	585	439	2 64	3 07	110	110	-
Franklin County	33 429	12 660	9 883	8 412	1 135	2 777	2 530	1 312	1 061	2 64	3 04	1 296	314	982
Gibson County	45 568	18 361	13 472	10 708	2 248	4 889	4 573	2 560	2 114	2 48	2 96	747	644	103
Giles County	25 336	9 832	7 454	6 038	1 116	2 378	2 218	1 166	891	2 58	3 02	405	205	200
Grainger County	16 912	6 394	5 076	4 281	591	1 318	1 217	590	459	2 64	3 02	183	146	37
Greene County	54 175	21 482	16 280	13 290	2 295	5 202	4 747	2 120	1 687	2 52	2.94	1 678	727	951
Grundy County	13 157	4 784	3 743	3 048	534	1 041	976	522	412	2 75	3 18	205	193	12
Hamblen County	49 750	19 429	14 795	11 895	2 314	4 634	4 138	1 629	1 313	2 56	2 97	730	525	205
Hamilton County	279 044	111 799	78 964	60 790	15 042	32 835	29 025	11 581	9 488	2 50	3 02	6 492	3 622	2 870
Hancock County	6 571	2 484	1 924	1 505	321	560	532	269	212	2 65	3 07	168	168	-
Hardeman County	22 589	8 276	6 190	4 534	1 356	2 086	1 887	968	751	2 73	3 22	788	770	18
Hardin County	22 350	8 726	6 633	5 490	882	2 093	1 940	978	764	2 56	3 00	283	263	20
Hawkins County	44 232	17 167	13 223	11 100	1 624	3 944	3 639	1 671	1 334	2 58	2 99	333	299	34
Haywood County	19 240	7 014	5 150	3 566	1 320	1 864	1 708	905	703	2 74	3 29	197	59	138
Henderson County	21 630	8 527	6 466	5 393	820	2 061	1 922	975	765	2 54	2 97	214	212	2
Henry County	27 456	11 362	8 216	6 743	1 126	3 146	2 902	1 619	1 282	2 42	2 89	432	388	44
Hickman County	15 715	5 976	4 608	3 883	526	1 368	1 229	619	505	2 63	3 04	1 039	1 039	-
Houston County	6 842	2 683	2 039	1 705	261	644	604	335	248	2 55	2 98	176	163	13
Humphreys County	15 551	6 063	4 593	3 844	561	1 470	1 373	665	514	2 56	3 01	244	110	134
Jackson County	9 176	3 642	2 782	2 303	334	860	806	475	358	2 52	2 94	121	119	2
Jefferson County	31 415	12 329	9 510	8 018	1 144	2 819	2 530	1 192	940	2 55	2 94	1 601	445	1 156
Johnson County	13 609	5 406	4 081	3 260	599	1 325	1 230	618	464	2 52	2 95	157	145	12
Knox County	323 400	133 639	90 561	71 679	15 478	43 078	36 661	12 962	10 642	2 42	2 97	12 349	3 288	9 061
Lake County	6 057	2 418	1 735	1 328	323	683	625	343	262	2 50	3 00	1 072	1 051	21
Lauderdale County	22 598	8 423	6 351	4 846	1 259	2 072	1 898	1 059	842	2 68	3 15	893	884	9
Lawrence County	34 992	13 338	10 265	8 665	1 291	3 073	2 884	1 596	1 317	2 62	3 06	311	302	9
Lewis County	9 098	3 533	2 606	2 179	328	927	859	451	353	2 58	3 06	149	136	13
Lincoln County	27 910	10 881	8 230	6 812	1 097	2 651	2 455	1 376	1 090	2 57	3 01	247	239	8
Loudon County	30 926	12 155	9 289	7 687	1 301	2 866	2 635	1 237	1 005	2 54	2.96	329	329	-
McMinn County	41 710	16 351	12 458	10 275	1 751	3 893	3 600	1 755	1 425	2.55	2.98	673	446	227
McNairy County	22 180	8 834	6 678	5 592	824	2 156	2 014	1 073	863	2.51	2.95	242	242	-
Macon County	15 817	6 159	4 711	4 027	522	1 448	1 356	707	577	2.57	3.00	89	56	33
Madison County	75 515	29 609	21 301	15 950	4 504	8 308	7 397	3 206	2 554	2.55	3.06	2 467	841	1 626
Marion County	24 645	9 215	7 171	5 838	1 032	2 044	1 873	963	761	2.67	3.08	215	205	10
Marshall County	21 248	8 268	6 120	4 950	881	2 148	1 954	989	779	2.57	3.04	291	229	62
Maury County	54 073	20 608	15 552	12 280	2 622	5 056	4 554	2 052	1 680	2.62	3.07	739	688	51
Meigs County	7 921	2 996	2 333	1 958	261	663	592	255	194	2.64	3.03	112	112	-
Monroe County	29 940	11 363	8 781	7 231	1 163	2 582	2 385	1 167	917	2.63	3.06	601	317	284
Montgomery County	93 516	34 345	26 914	22 284	3 712	7 431	6 208	2 071	1 628	2.72	3.09	6 982	472	6 510
Moore County	4 714	1 734	1 391	1 222	112	343	327	169	136	2.72	3.11	7	7	-
Morgan County	16 011	5 841	4 621	3 745	680	1 220	1 119	558	432	2.74	3.13	1 289	1 289	-
Obion County	31 399	12 412	9 219	7 624	1 279	3 193	2 950	1 598	1 290	2.53	3.00	318	298	20
Overton County	17 435	6 734	5 266	4 404	645	1 468	1 368	745	581	2.59	2.99	201	192	9
Perry County	6 460	2 512	1 905	1 650	186	607	568	300	232	2.57	3.02	152	152	-
Pickett County	4 494	1 786	1 330	1 105	169	456	430	239	184	2.52	2.98	54	49	5
Polk County	13 538	5 092	4 010	3 373	455	1 082	990	519	418	2.66	3.05	105	105	-
Putnam County	48 419	19 753	13 994	11 578	1 913	5 759	4 757	1 945	1 593	2.45	2.93	2 954	534	2 420
Rhea County	23 638	9 185	6 985	5 606	1 088	2 200	2 022	984	779	2.57	3.00	706	410	296
Roane County	46 747	18 453	13 967	11 612	1 831	4 486	4 126	1 970	1 592	2.53	2.96	480	434	46
Robertson County	41 045	14 801	11 886	9 903	1 537	2 915	2 623	1 283	990	2.77	3.14	449	449	-
Rutherford County	113 372	42 118	31 225	25 678	4 272	10 893	8 545	2 671	2 136	2.69	3.14	5 198	1 455	3 743
Scott County	18 189	6 534	5 128	4 150	765	1 406	1 311	684	553	2.78	3.21	169	169	-
Sequatchie County	8 278	3 287	2 555	2 087	353	732	656	322	252	2.67	3.06	85	85	-
Sevier County	50 394	19 520	15 091	12 706	1 853	4 429	3 858	1 561	1 239	2.58	2.96	649	582	67
Shelby County	803 085	303 571	212 076	144 773	56 404	91 495	77 999	25 382	20 245	2.65	3.22	23 245	12 180	11 065
Smith County	13 998	5 358	4 151	3 579	447	1 207	1 127	643	512	2.61	3.03	145	134	11
Stewart County	9 295	3 678	2 812	2 452	251	866	793	444	344	2.53	2.93	184	95	89
Sullivan County	141 449	56 729	42 516	35 372	5 632	14 213	13 048	5 674	4 669	2.49	2.93	2 147	1 351	796
Sumner County	102 065	36 850	29 511	24 907	3 545	7 339	6 384	2 579	2 093	2.77	3.13	1 216	637	579
Tipton County	37 301	13 033	10 345	8 119	1 780	2 688	2 410	1 198	924	2.86	3.27	267	267	-
Trousdale County	5 795	2 261	1 715	1 402	241	546	512	265	207	2.56	3.01	125	100	25
Unicoi County	16 318	6 621	4 938	4 074	653	1 683	1 565	868	703	2.46	2.91	231	220	11
Union County	13 573	4 932	3 992	3 325	508	940	841	385	300	2.75	3.10	121	90	31
Van Buren County	4 841	1 799	1 451	1 199	190	348	322	149	105	2.69	3.05	5	5	-
Warren County	32 597	12 681	9 601	7 861	1 365	3 080	2 834	1 404	1 152	2.57	3.01	395	381	14
Washington County	87 891	35 823	25 375	20 537	3 798	10 448	9 004	3 632	2 945	2.45	2.95	4 424	2 017	2 407
Wayne County	13 709	5 174	4 079	3 448	482	1 095	1 011	551	448	2.65	3.03	226	204	22
Weakley County	29 569	11 992	8 589	7 194	1 076	3 403	2 928	1 475	1 203	2.47	2.95	2 403	479	1 924
White County	19 880	7 722	5 986	4 989	765	1 736	1 622	915	725	2.57	2.98	210	192	18
Williamson County	80 308	27 928	23 096	20 255	2 228	4 832	4 146	1 389	1 117	2.88	3.20	713	699	14
Wilson County	67 110	24 070	19 610	16 710	2 249	4 460	3 910	1 688	1 335	2.79	3.13	565	271	294

REFERENCE NO. 17

BLACK & VEATCH Waste Science, Inc.
Philadelphia Office

MEMORANDUM

USEPA Region IV
Treatment Plant/Oil Services Company
Population served by groundwater

BVWS Project 52012.545
BVWS File N
February 13, 1995

To: Treatment Plant/Oil Services Co. File

From: Michael Ferrari

The following table depicts the distribution of the population within 4 miles of the site that obtain their water supply from groundwater or springs. This is the portion of the surrounding population which is *not* served by CPW water.

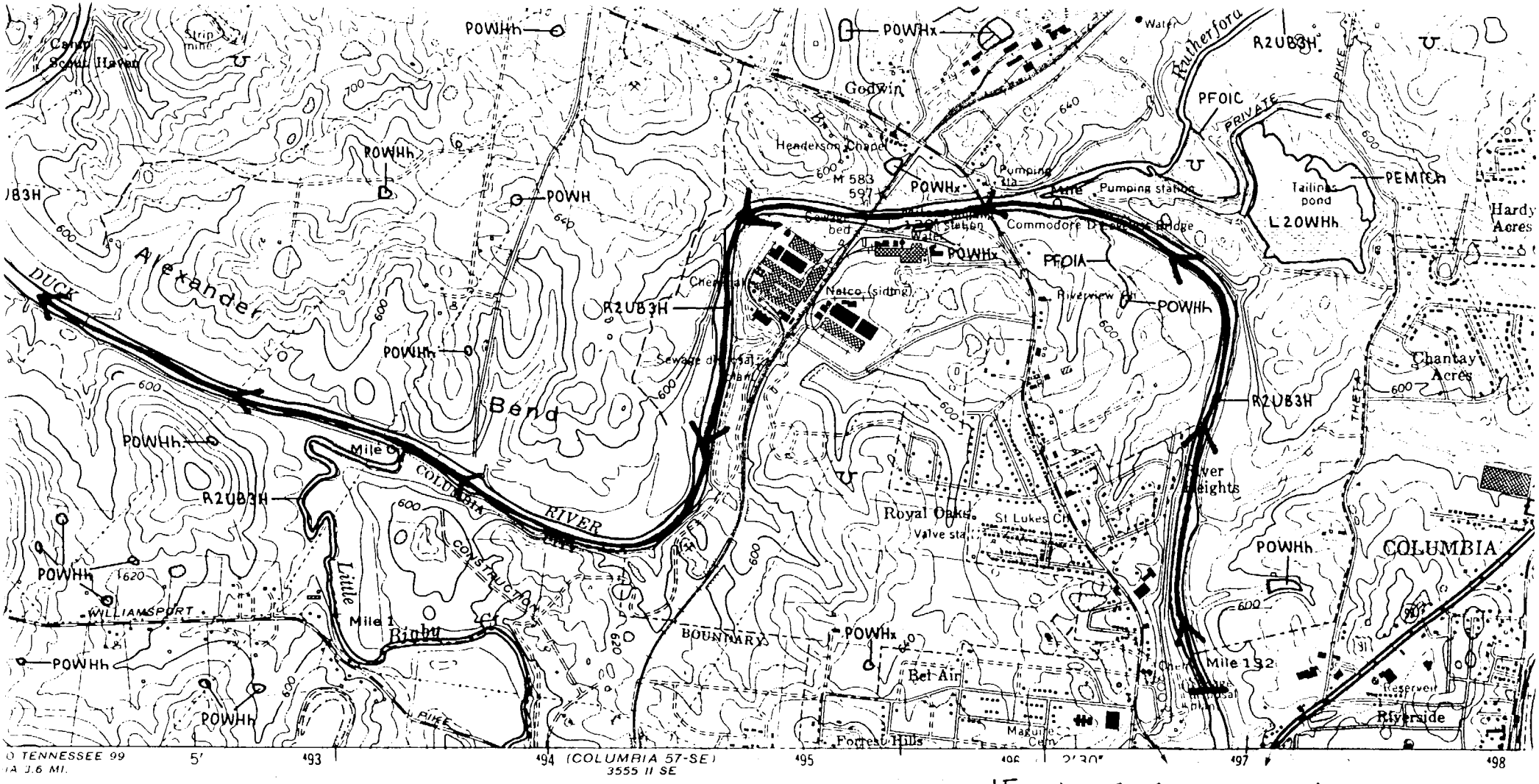
Population within 4 miles of Treatment Plant site
using groundwater or springs for drinking water

Distance Ring (miles)	Houses served by Private Supply	County Population per Household[1]	Total Population using groundwater or springs
0 - ¼	0	2.62	0
¼ - ½	0	2.62	0
½ - 1	0	2.62	0
1 - 2	8	2.62	21
2 - 3	13	2.62	34
3 - 4	28	2.62	73
Total			**128**

[1] Value of 2.62 is the Maury County persons per household figure obtained from U.S. Bureau of Census data.

Atlanta\..\gwpop.mem
02/13/95

REFERENCE NO. 18



15 mile Surface Water Migration Pathway Map for

TREATMENT PLANT/OIL SERVICES CO.

Columbia, Maury County, TN

TND 980515779

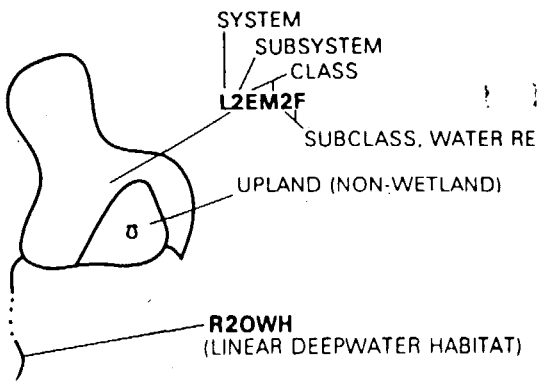
BVWS Project #52012.545

SPECIAL NOTE

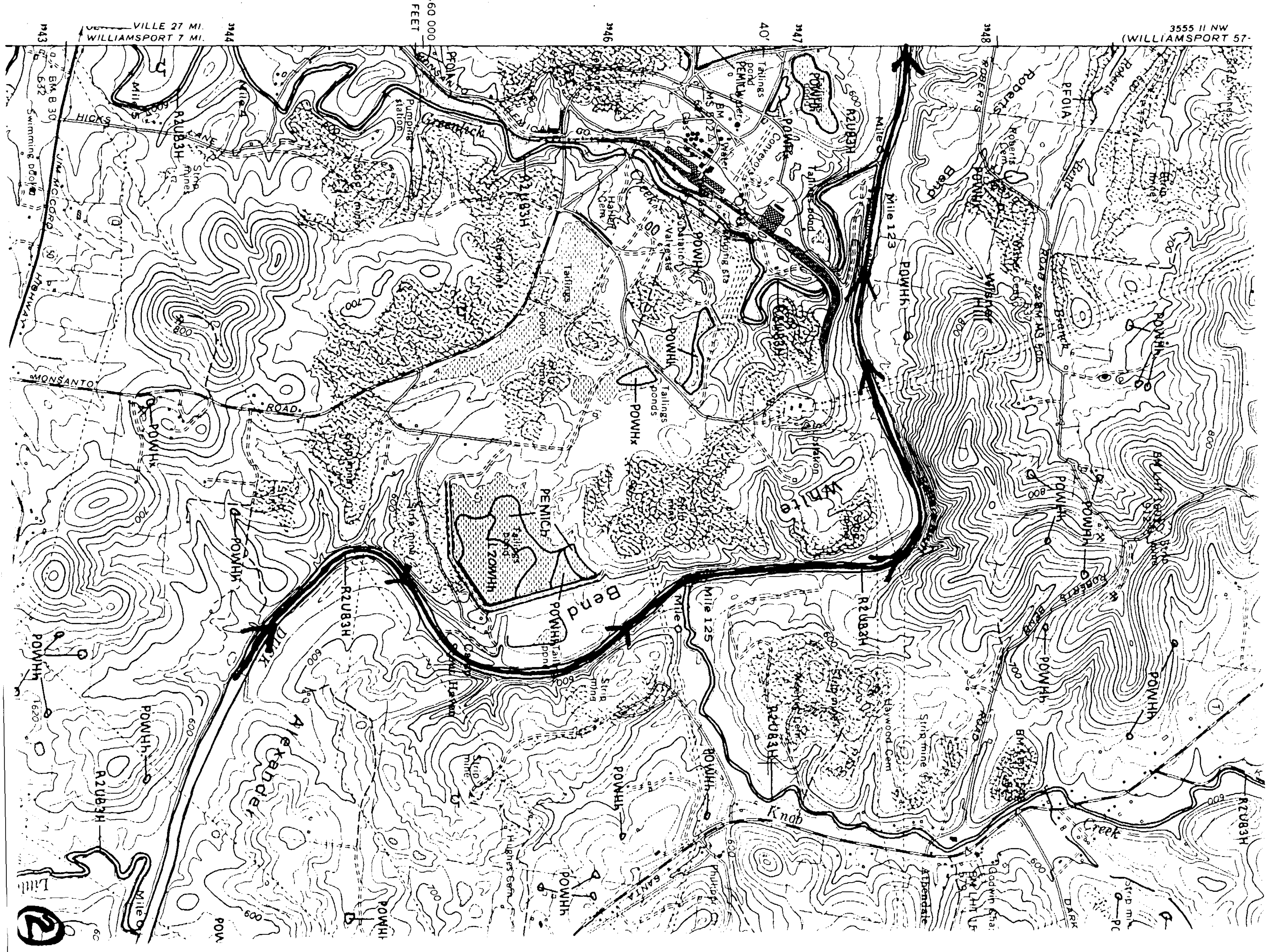
This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS - 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

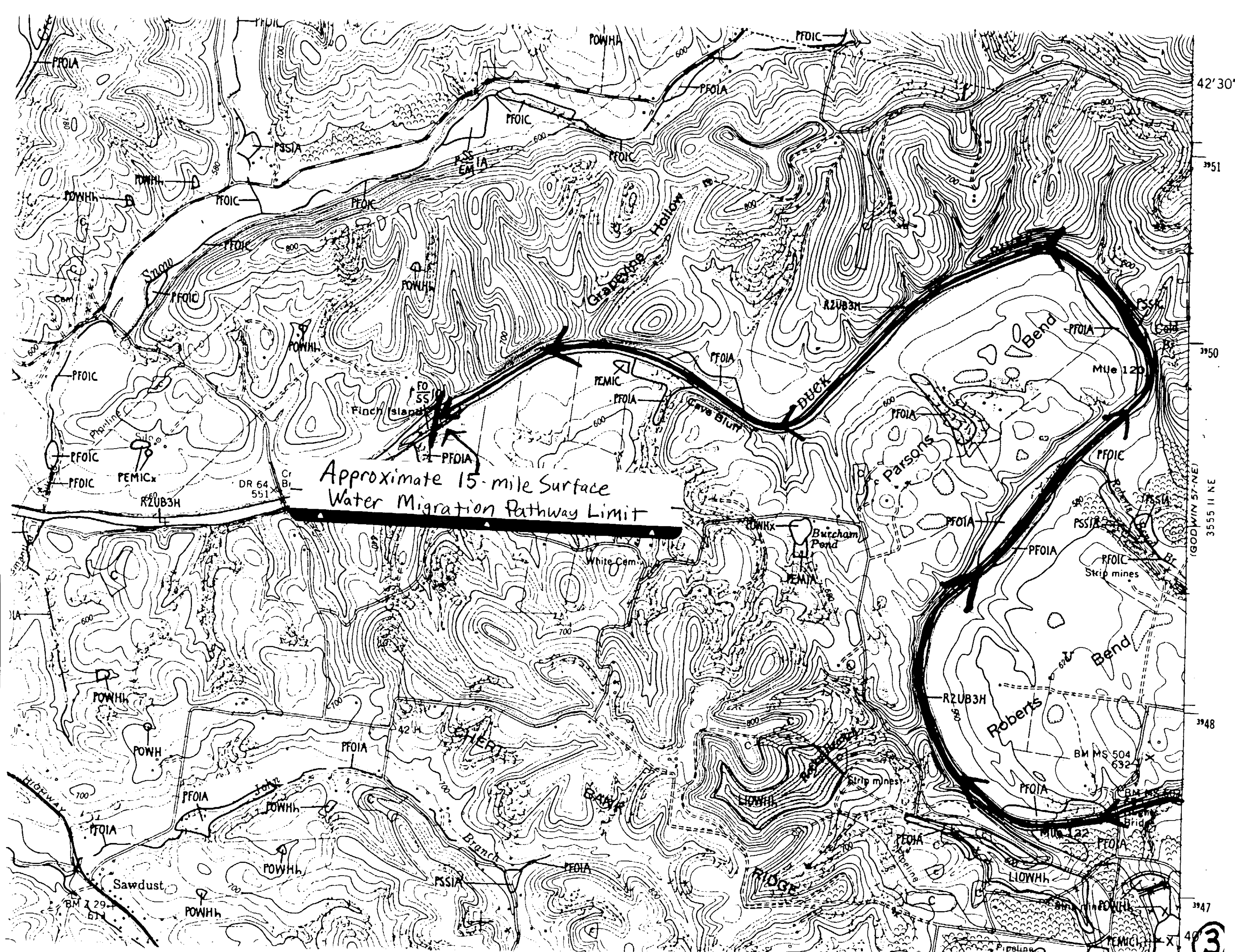
Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is

SYMBOLOGY EXAMPLE



(1)


VILLE 27 MI.
WILLIAMSPORT 7 MI.
460 000
FEET
3555 II NW
(WILLIAMSPORT 57-
HICKS
MONSANTO
ROAD
Pumping station
Greenlick
Tailings pond
Tailings ponds
Strip mine
Mile 123
Mile 125
R2UB3H
POWHh
POWHx
PEMICh
White
Bend
Dick
Alexander
Knob
Creek
Haywood Cem
Hughes Cem
Roberts
ROAD

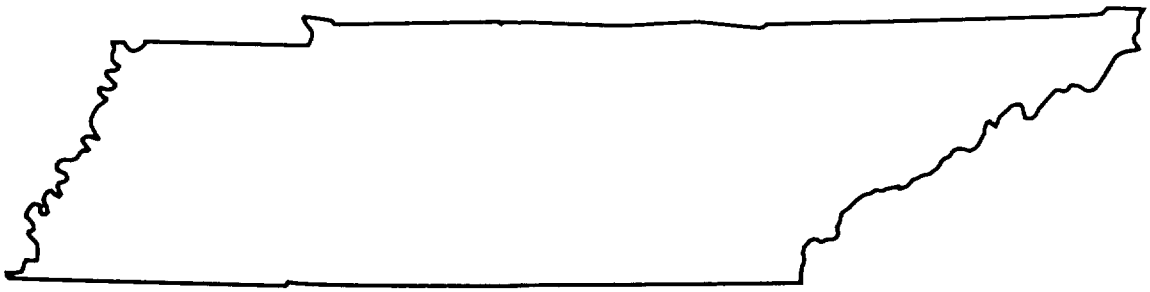


Approximate 15-mile Surface Water Migration Pathway Limit
Grapevine Hollow
Snow
DUCK
Finch Island
Cave Bluff
Parsons
Bend
Roberts
Bend
Mile 120
Mile 122
Burcham Pond
White Cem
Strip mines
Sawdust
John
Branch
RIDGE
HIGHWAY
DR 64
551
BM MS 504
632
PFOIA
PFOIC
POWHh
PEMIC
PEMICx
R2UB3H
PSSIA
L1OWHh
42'30"
3555 II NE
(GODWIN 57-NE)
3

REFERENCE NO. 19

Water Resources Data Tennessee Water Year 1992

by D.F. Flohr, F.D. Edwards, J.G. Lewis, and R.A. Orr



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT TN-92-1
Prepared in cooperation with the State of Tennessee
and with other agencies

03599500 DUCK RIVER AT COLUMBIA, TN

LOCATION.--Lat 35°37'05", long 87°01'56", Maury County, Hydrologic Unit 06040003, on right bank 4 ft downstream from bridge on former U.S. Highway 31, 2 blocks north of public square in Columbia, 2.4 mi upstream from Rutherford Creek, and at mile 132.8.

DRAINAGE AREA.--1,208 mi².

PERIOD OF RECORD.--October 1904 to December 1908, April 1920 to current year. Monthly discharge only for some periods, published in WSP 1305. Gage-height records collected at same site, 1887-95, 1911 (fragmentary), 1947-71, published in reports of U.S. Weather Bureau, 1983-1991, discharge records furnished by Tennessee Valley Authority.

REVISED RECORD.--WSP 783: 1929(M). WSP 853: Drainage area. WSP 1306: 1905-9, 1920-22, 1923(M).

GAGE.--Water-stage encoder and satellite telemeter at station. Datum of gage is 535.33 ft above National Geodetic Vertical Datum of 1929, supplementary adjustment of 1955. Prior to Jan. 9, 1925, nonrecording gages near this site; all gages at datum 2.37 ft higher prior to Oct. 1, 1933.

REMARKS.--No estimated daily discharges. Records good. Maximum discharge prior to regulation, 61,500 ft³/s, Mar. 17, 1973; maximum gage height, 51.75 ft Feb. 14, 1948; minimum no flow Oct. 22, 1922, caused by regulation by power plant .75 mi upstream. Flow regulated by Normandy Lake (station 03596460) since January 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of March 30, 1902, reached a stage of 48.0 ft, present datum, discharge, 50,700 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 40,800 ft³/s, Dec. 3, gage height, 41.70 ft; minimum, 169 ft³/s, Oct. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	224	252	14000	3700	999	3270	1640	481	216	819	247	823
2	202	234	25900	3220	944	2620	1430	442	237	998	307	627
3	182	229	39600	5970	895	2240	1260	399	269	1750	335	700
4	177	225	38100	11000	856	1810	1110	345	1820	2110	257	788
5	171	217	29000	8110	786	1390	1000	316	1220	1820	248	1120
6	171	213	10400	4960	631	1220	887	293	1010	2200	268	1000
7	180	321	5220	4340	581	1110	836	282	776	2700	297	775
8	231	498	4320	3970	552	1090	834	281	628	1710	261	619
9	226	493	6390	3900	523	1080	890	276	584	1210	239	604
10	210	490	13400	5110	492	11500	811	286	468	918	270	468
11	205	489	11900	3880	467	15600	732	285	992	732	458	372
12	205	486	6730	2620	448	8160	672	284	752	608	587	312
13	191	480	6420	2560	441	4470	613	317	637	516	518	283
14	194	476	12100	6230	448	3270	564	321	1360	452	1160	284
15	191	476	12500	5610	498	2610	578	360	1020	414	1060	268
16	187	471	7240	4320	641	2200	691	316	692	387	572	253
17	186	472	5110	3470	707	1940	586	259	509	374	378	247
18	189	469	4170	2970	785	1830	578	228	417	362	297	575
19	181	462	3540	2150	800	2680	525	209	421	341	253	601
20	181	573	3140	1690	778	3210	577	194	1990	333	232	640
21	178	911	2870	1510	710	2910	1270	191	1050	318	228	512
22	176	939	2700	1380	645	2220	2320	209	635	294	233	3970
23	266	1610	2710	1410	2900	2300	2170	233	447	290	435	17100
24	610	1780	4710	1650	7650	2680	1430	231	383	844	410	19000
25	994	1170	5170	1670	5680	2220	1070	204	357	1090	537	6550
26	697	882	3500	1480	8390	2020	862	191	1270	569	671	4700
27	482	759	2730	1340	10100	1980	742	182	1980	393	700	6010
28	376	724	2740	1250	6440	1750	649	178	1660	326	2410	4420
29	316	693	6420	1170	4420	1530	577	207	981	286	4400	3000
30	282	1770	6470	1110	---	1540	528	207	693	264	2390	2150
31	262	---	4290	1050	---	1720	---	198	---	255	1210	---
TOTAL	8523	19264	303490	104800	60207	96170	28432	8405	25474	25683	21868	78771
MEAN	275	642	9790	3381	2076	3102	948	271	849	828	705	2626
MAX	994	1780	39600	11000	10100	15600	2320	481	1990	2700	4400	19000
MIN	171	213	2700	1050	441	1080	525	178	216	255	228	247
(†)	-2300	-8000	-9000	-2100	+2200	+6500	+5800	+100	+1500	-1400	-700	+1500
MEAN‡	201	375	9500	3313	2152	3312	1141	274	899	783	683	2676
CFSM‡	.17	.31	7.86	2.74	1.78	2.74	.94	.23	.74	.65	.57	2.22
IN.‡	.19	.35	9.07	3.16	1.92	3.16	1.05	.26	.83	.75	.65	2.47

CAL YR 1991 MEAN‡ 3112 CFSM‡ 2.58 IN.‡ 34.97
WTR YR 1992 MEAN‡ 2140 CFSM‡ 1.77 IN.‡ 24.11

† Change in contents, in cfs-days, in Normandy Lake.
‡ Adjusted for change in contents.
NOTE.--Contents (cfs-days) for adjustments furnished by Tennessee Valley Authority.

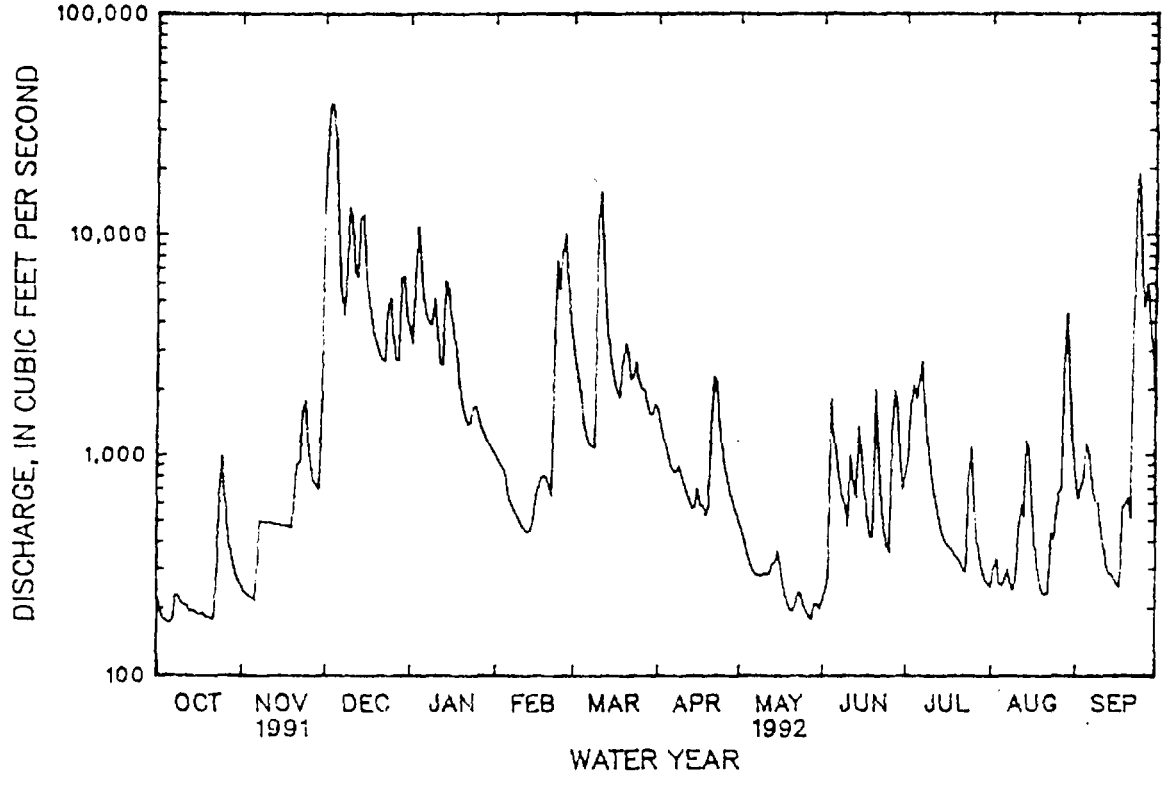
03599500 DUCK RIVER AT COLUMBIA, TN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1992, BY WATER YEAR (WY)

MEAN	842	2299	3804	3375	3606	3745	2533	2255	882	726	401	728
MAX	3642	5925	10360	8513	9901	10090	6984	9105	4117	4740	938	3832
(WY)	1990	1987	1991	1979	1991	1980	1983	1983	1989	1989	1982	1979
MIN	180	236	418	273	953	1104	325	244	167	220	185	163
(WY)	1988	1981	1981	1986	1978	1985	1986	1988	1988	1988	1991	1984

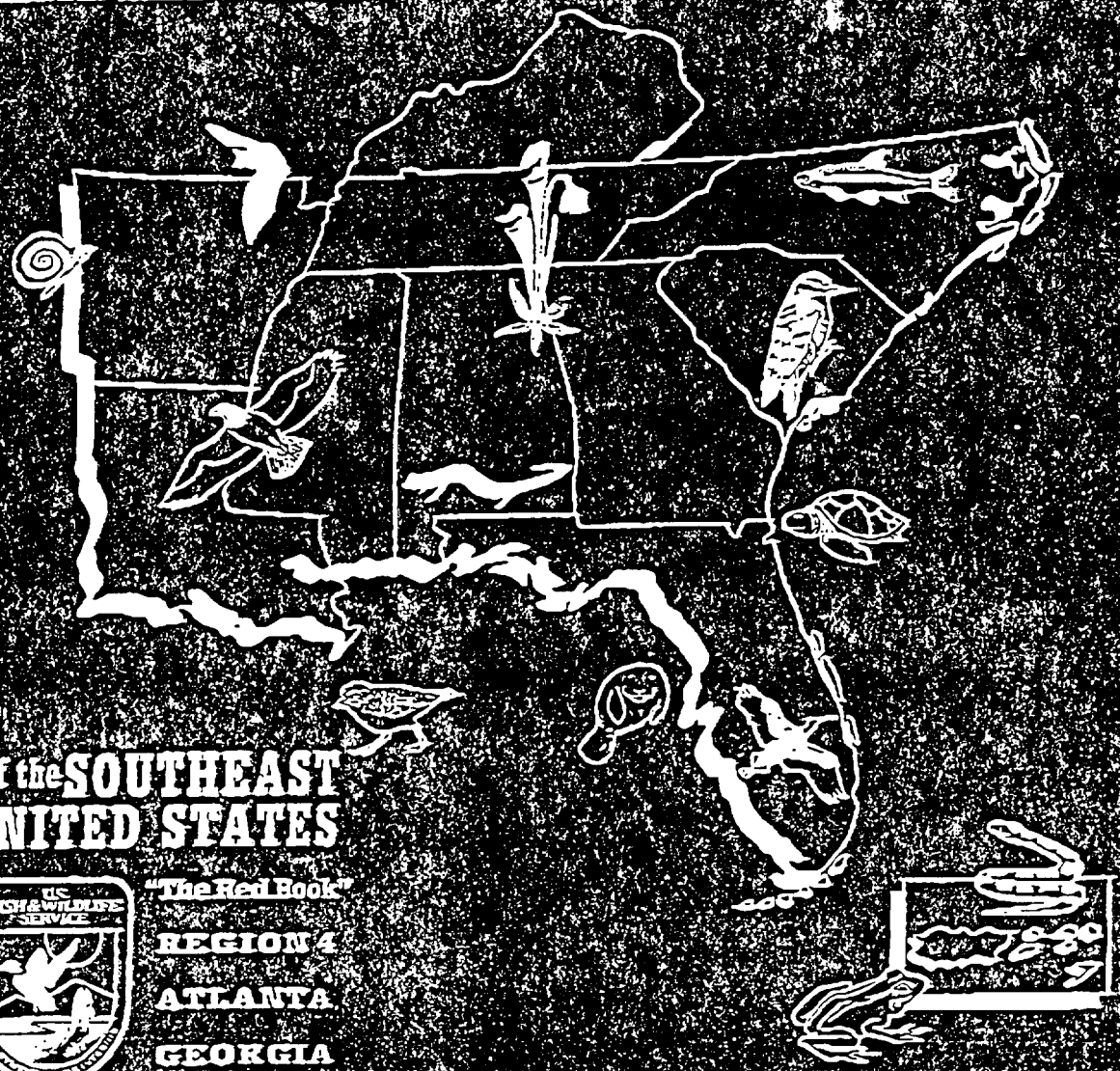
SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		*WATER YEARS 1977 - 1992	
ANNUAL TOTAL	1144351		781087			
ANNUAL MEAN	3135		2134		2094	
HIGHEST ANNUAL MEAN					3282	1989
LOWEST ANNUAL MEAN					553	1981
HIGHEST DAILY MEAN	52300	Feb 20	39600	Dec 3	52300	Feb 20 1991
LOWEST DAILY MEAN	117	Sep 13	171	aOct 5	86	Oct 4 1982
ANNUAL SEVEN-DAY MINIMUM	123	Sep 8	183	Oct 16	100	Sep 28 1982
INSTANTANEOUS PEAK FLOW			40800	Dec 3	52300	Feb 20 1991
INSTANTANEOUS PEAK STAGE			41.70	Dec 3	45.82	Feb 20 1991
INSTANTANEOUS LOW FLOW			169	Oct 5		
ANNUAL RUNOFF (CFSM)	2.60		1.77		1.73	
ANNUAL RUNOFF (INCHES)	35.24		24.05		23.55	
10 PERCENT EXCEEDS	7060		5110		4870	
50 PERCENT EXCEEDS	1110		717		732	
90 PERCENT EXCEEDS	170		227		187	

* Regulated period only.
a Also occurred Oct. 6



REFERENCE NO. 20

ENDANGERED & THREATENED SPECIES



of the SOUTHEAST UNITED STATES

"The Red Book"

REGION 4

ATLANTA

GEORGIA

ENDANGERED AND THREATENED SPECIES

OF THE

SOUTHEASTERN UNITED STATES

(THE RED BOOK)

Prepared by:

U.S. Fish and Wildlife Service
Southeast Region
Atlanta, Georgia

January 1992

Availability Unlimited
For Sale by Superintendent of Documents
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Stock Order Number: 924-003-00000-6

4/22/92

Federally Listed Species by State

TENNESSEE

(E=Endangered; T=Threatened; CH=Critical Habitat determined)

Mammals	General Distribution
Bat, gray (Myotis grisescens) - E	Entire State
Bat, Indiana (Myotis sodalis) - E, CH	Central, East
Cougar, eastern (Felis concolor couguar) - E	North, East
Panther, Florida (Felis concolor coryi) - E	Southwest
Squirrel, Carolina northern flying (Glaucomys sabrinus coloratus) - E	Eastern mountains (Carter and Sevier Counties)
Birds	
Eagle, bald (Haliaeetus leucocephalus) - E	Entire State
Falcon, American peregrine (Falco peregrinus anatum) - E	East, Central, Extreme Northwest
Falcon, Arctic peregrine (Falco peregrinus tundrius) - T	Entire State (mostly West)
Tern, least (Sterna antillarum) interior population - E	Mississippi River
Warbler, Bachman's (Vermivora bachmanii) - E	West
Warbler, Kirtland's (Dendroica kirtlandii) - E	Extreme Northeast
Woodpecker, ivory-billed (Campephilus principalis) - E	Extreme West
Woodpecker, red-cockaded (Picoides [=Dendrocopos] borealis) - E	East
Fishes	
Chub, slender (Hybopsis cahni) - T,CH	Hancock, Claiborne, Grainger Counties
Chub, spotfin (Hybopsis monacha) - T,CH	Hawkins, Sullivan, Morgan, Fentress, and Cumberland Counties
Dace, blackside (Phoxinus cumberlandensis) - T	Upper Cumberland River System (Scott, Campbell, and Claiborne Counties)
Darter, amber (Percina antesella) - E,CH	Conasauga R., Polk County

State Lists 4/22/92

TENNESSEE (Cont'd)

	General Distribution
Darter, boulder (Etheostoma [Nothonotus] sp.) - E	Lower Elk River System, Giles County
Darter, slackwater (Etheostoma boschungi) - T,CH	Wayne and Lawrence Counties
Darter, snail (Percina tanasi) - T	Knox, Loudon, Meigs, Polk, Bradley/McMinn, Hamilton, Marion, and Giles Counties
Logperch, Conasauga (Percina jenkinsi) - E,CH	Conasauga R., Polk County
Madtom, smoky (Noturus bailey) - E,CH	Citico Creek, Monroe County
Madtom, yellowfin (Noturus flavipinnis) - T,CH	Claiborne and Hancock Counties; Monroe County (Citico Creek)
Shiner, blue (Cyprinella caerulea) - T	Conasauga River and Minnewauga Creek
Mollusks	
Mussel, Alabama lamp pearly (Lampsilis virescens) - E	Estill Fork, Franklin County
Mussel, Appalachian monkeyface pearly (Quadrula sparsa) - E	Powell River
Mussel, birdwing pearly (Conradilla caelata) - E	Powell, Clinch, Elk and Duck Rivers
Mussel, Cumberland bean pearly (Villosa trabilis) - E	Big S. Fork of Cumberland River
Mussel, Cumberland monkeyface pearly (Quadrula intermedia) - E	Elk, Powell and Duck Rivers
Mussel, Cumberland pigtoe (Pleurobema gibberum) - E	Caney Fork River System
Mussel, dromedary pearly (Dromus dromas) - E	Powell, Clinch, Cumberland and Tennessee Rivers
Mussel, fine-rayed pigtoe pearly (Fusconaia cuneolus) - E	Powell, Clinch, Elk, Sequatchie, N. Fork Holston and Little Rivers

TENNESSEE (Cont'd) State Lists 4/22/92

Mussel, green-blossom pearly (Epioblasma [=Dysnomia] torulosa gubernaculum) - E	Clinch River
	General Distribution
Mussel, little-wing pearly (Pegias fabula) - E	Cave Creek
Mussel, orange-footed pearly (Plethobasus cooperianus) - E	Tennessee and Cumberland Rivers
Mussel, pale lilliput pearly Toxolasma [= Carunculina] cylindrella) - E	Historic; no recent TN records
Mussel, pink mucket pearly (Lampsilis orbiculata) - E	Tennessee, Clinch and Cumberland Rivers
Mussel, rough pigtoe pearly (Pleurobema plenum) - E	Clinch, Cumberland and Tennessee Rivers
Mussel, shiny pigtoe pearly (Fusconaia edgariana) - E	Powell, Clinch and Elk Rivers
Mussel, tan riffle shell (Epioblasma [=Dysnomia] walkeri) - E	Historic; no recent TN records
Mussel, tuberculed-blossom pearly (Epioblasma [=Dysnomia] torulosa torulosa) - E	Possibly extinct
Mussel, turgid-blossom pearly (Epioblasma [=Dysnomia] turgidula) - E	Possibly extinct
Mussel, white warty-back pearly (Plethobasus cicatricocus) - E	Tennessee River
Mussel, yellow-blossom pearly (Epioblasma [=Dysnomia] florentina florentina) - E	Possibly extinct
Snail, Chittenango ovate amber (Succinea chittenangoensis) - T	Monroe County
Snail, painted snake coiled forest (Anguispira picta) - T	Franklin County
Arthropods:	
Crayfish, Nashville (Orconectes shoupi) - E	Mill Creek, Davidson and Williamson Counties
Plants	
Arenaria cumberlandensis (Cumberland sandwort) - E	Cumberland plateau north central (Fentress, Morgan, Pickett, and Scott Counties)

TENNESSEE (Cont'd)

State Lists 4/22/92

	General Distribution
Conradina verticillata (Cumberland rosemary) - T	Big South Fork Cumberland River, Morgan, Scott, and Fentress Counties; Caney Fork River, Cumberland and White Counties; Obed River System, Morgan and Cumberland Counties
Astragalus bibullatus (Guthrie's ground-plum) - E	Rutherford County
Dalea foliosa (=Petalostanum foliosum) - (Leafy prairie clover) - E	Rutherford, Wilson, Marshall, Bedford, Davidson, Williamson, and Maury Counties
Echinacea tennesseensis (Tennessee coneflower) - E	Davidson, Rutherford, Wilson Counties
Isotria medeoloides (small whorled pogonia) - E	Hamilton County
Phyllitis scolopendrium var. Americana (American Hart's Tongue Fern) - T	Marion County
Pityopsis ruthii (Ruth's golden aster) - E	Polk County
Scutellaria montana (large-flowered skullcap) - E	Hamilton and Marion Counties
Solidago spithamaea (Blue Ridge goldenrod) - T	Carter County
Xyris Tennesseensis (Tennessee yellow-eyed grass) - E	Lewis County

REFERENCE NO. 21

CENSUS DATA

Treatment Plt
LATITUDE 35:37:38 LONGITUDE 87: 2:15 1990 HOUSING

KM	0-¼ mile 0.00-.400	¼-½ mile .400-.800	½-1 mile .800-1.60	1-2 miles 1.60-3.20	2-3 miles 3.20-4.80	3-4 miles 4.80-6.40	SECTOR TOTALS
S 1	0	0	0	0	104	0	104
S 2	0	0	687	779	0	0	1466
S 3	0	0	0	489	0	0	489
S 4	0	0	0	1595	247	0	1842
S 5	0	0	508	649	869	0	2026
S 6	0	0	430	698	2129	658	3915
S 7	0	0	774	517	0	306	1597
S 8	0	0	517	0	0	0	517
RING TOTALS	0	0	2916	4727	3349	964	11956

Press RETURN key to continue ...
ANSILG ONRINB0:09600 7E1 [Home]=Menu FDX 8 LF X

GEMS database printout for the Treatment Plant/Oil Services Company site.

Downloaded by Corry T. Platt, BYWS, February 13, 1995.

REFERENCE NO. 22

BLACK & VEATCH Waste Science, Inc.
Philadelphia Office

MEMORANDUM

USEPA Region IV
Treatment Plant/Oil Services Company
Population Within 4 mile radius

BVWS Project 52012.545
BVWS File N
February 13, 1995

To: Treatment Plant/Oil Services Co. File

From: Michael Ferrari MF

The following table depicts the distribution of the population within 4 miles of the site.

Distance Ring (miles)	Houses	County Population per Household	Total Population
0 - ¼	29[1]	2.62[2]	76
¼ - ½	193[1]	2.62[2]	506
½ - 1	-	-	2,916[3]
1 - 2	-	-	4,727[3]
2 - 3	-	-	3,349[3]
3 - 4	-	-	964[3]
Total			**12,538**

[1] Number of houses obtained from house count from USGS topographic maps.

[2] Value of 2.62 is the Maury County persons per household figure obtained from U.S. Bureau of Census data.

[3] Population values obtained from GEMS database.

Atlanta\..\pop.mem
02/13/95

REFERENCE NO. 23

BLACK & VEATCH Waste Science, Inc.
Philadelphia Office

MEMORANDUM

USEPA Region IV
Treatment Plant/Oil Services Company
Wetlands within 4 miles of site

BVWS Project 52012.545
BVWS File N
February 10, 1995

To: Treatment Plant/Oil Services Co. File

From: Michael Ferrari MF

The following table depicts the distribution of wetlands within 4 miles of the site.

Distance Ring (miles)	Wetland acreage
0 - ¼	0
¼ - ½	0
½ - 1	0
1 - 2	11
2 - 3	24
3 - 4	39
Total	**74 acres**

Atlanta\..\wetlands.mem
02/10/95

2 / 5

REGION: 04
STATE : TN

U.S. ENVIRONMEN PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
C E R C L I S V 1.2

I : 933
RUN DATE: 02/03/87
RUN TIME: 13:53:24

M.2 - SITE MAINTENANCE FORM

		* ACTION: _	*
EPA ID : TND980515779			
SITE NAME: TREATMENT PLANT/OIL SERVICES CO	SOURCE: H	* _____ _	*
STREET : 408 SANTA FE PIKE	CONG DIST: 06	* _____ __	*
CITY : COLUMBIA	ZIP: 38401	* _____ _____-____	*
CNTY NAME: MAURY	CNTY CODE : 119	* _____ ___	*
LATITUDE : 35/36/54.0	LONGITUDE : 087/02/12.0	* __/__/__._ ___/__/__._	*
LL-SOURCE: R	LL-ACCURACY:	* _ _	*
SMSA :	HYDRO UNIT: 06040003	* ____ _____	*
INVENTORY IND: Y REMEDIAL IND: Y	REMOVAL IND: N FED FAC IND: N	* _ _ _ _	*
NPL IND: N NPL LISTING DATE:	NPL DELISTING DATE:	* _ __/__ __/__	*
SITE/SPILL IDS:		* __ __ __ __ __	*
RPM NAME:	RPM PHONE: - -	* _____ ___-___-____	*
SITE CLASSIFICATION:	SITE APPROACH:	* __ ___	*
DIOXIN TIER:	REG FLD1: REG FLD2: 4	* ____ _____ _	*
RESP TERM: PENDING ( )	NO FURTHER ACTION ( )	* PENDING (_) NO FURTHER ACTION (_)	*
ENF DISP: NO VIABLE RESP PARTY ( )	VOLUNTARY RESPONSE ( )	* _ _	*
ENFORCED RESPONSE ( )	COST RECOVERY ( )	* _ _	*

SITE DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

M.2 - PROGRAM MAINTENANCE FORM

ACTION: _

SITE: TREATMENT PLANT/OIL SERVICES CO

EPA ID: TND980515779 PROGRAM CODE: H01 PROGRAM TYPE:

PROGRAM QUALIFIER: ALIAS LINK :

PROGRAM NAME: SITE EVALUATION

DESCRIPTION:

REGION: 04
STATE : TN

U.S. ENVIRONMEN PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
C E R C L I S V 1.2

.: 935
RUN DATE: 02/03/87
RUN TIME: 13:53:24

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: TREATMENT PLANT/OIL SERVICES CO
PROGRAM: SITE EVALUATION

EPA ID: TND980515779 PROGRAM CODE: H01 EVENT TYPE: DS1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: E * _ ___ _ *

EVENT NAME: DISCOVERY STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START:	* __/__/__	__/__/__	__/__/__ *
COMP :	COMP :	COMP : 03/01/81	* __/__/__	__/__/__	__/__/__ *

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %				
			0	* _____	_____	__	___ *

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: TREATMENT PLANT/OIL SERVICES CO
PROGRAM: SITE EVALUATION

EPA ID: TND980515779 PROGRAM CODE: H01 EVENT TYPE: PA1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: S * _ ___ _ *

EVENT NAME: PRELIMINARY ASSESSMENT STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START: 01/01/84	* __/__/__	__/__/__	__/__/__ *
COMP :	COMP :	COMP : 08/01/84	* __/__/__	__/__/__	__/__/__ *

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %				
			0	* _____	_____	__	___ *

REGION: 04
STATE : TN

U.S. ENVIRONMEN PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
C E R C L I S V 1.2

. . : 937
RUN DATE: 02/03/87
RUN TIME: 13:53:24

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: TREATMENT PLANT/OIL SERVICES CO
PROGRAM: SITE EVALUATION

EPA ID: TND980515779 PROGRAM CODE: H01 EVENT TYPE: SI1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: S * _ ___ _ *

EVENT NAME: SITE INSPECTION STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START: 06/01/84	* __/__/__	__/__/__	__/__/__ *
COMP :	COMP :	COMP : 08/01/84	* __/__/__	__/__/__	__/__/__ *

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %				
			0	* _____	_____	__	___ *

M.2 - COMMENT MAINTENANCE FORM

SITE: TREATMENT PLANT/OIL SERVICES CO

EPA ID: TND980515779

COM NO	COMMENT	ACTION
001	PART A- ON FILE	* _ _____ *
		* _____ *

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT

OFFICE CORRESPONDENCE

FROM	TO	DATE

DATE: April 10, 1984

TO: THE FILE

FROM: Karen Bonner

SUBJECT: §3012 Superfund Program
Oil Service Treatment Plant

~~OIL SERVICE TREATMENT PLANT~~

On March 5, 1984, at 12:30 p.m., Charles Allen and I, employees of the TN. Division of SWM, visited this site. We talked with Kenneth Harris and Steve Maloney.

Mr. Maloney works for Tri-Tech Laboratories, which manages the treatment plant for Oil Services. Waste oil is brought to this plant, which is the old sewer treatment plant. After it is processes, the sludge that is produced is hauled off by Oil Services. The water that is produced is discharged into the sewer system and is checked periodically.

Based on this investigation, we recommend **NO FURTHER ACTION.**

FROM	DATE

TO

PH-0001
SR 3/77

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515779

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO. OR SPECIFIC LOCATION IDENTIFIER				
OJ Service Co. / Treatment Plant	408 Santa Fe Pike				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Columbia	TN	38401	Maury		

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
— — — — — —	— — — — — —	X A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
4 - 5 - 84 (MONTH - DAY - YEAR)	X ACTIVE ☐ INACTIVE	1980 (BEGINNING YEAR) | present (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
XE STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO
Karen Bonner	Chemist	Sum	(615) 741-6287
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Charles Allen	Engineer	Sum	6157416287
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Kenneth Harris	President	202 Hull St. Columbia, TN 38401	(615) 381-4999
Steve Maloney	Operator	Tri-Tech Waldron Rd Lawrence, Tn.	(615) 388-3488
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
X PERMISSION ☐ WARRANT	12:30 PM	Cloudy, 45°F

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Steve Maloney	Tri-Tech Laboratories	(615) 793-7849

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Karen Bonner	Sum		615-741-6287	4 - 9 - 84 (MONTH - DAY - YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515779

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A. SOLID
- B. POWDER, FINES
- C. SLUDGE
- D. OTHER: _____ (Specify)
- E. SLURRY
- X F. LIQUID
- G. GAS

02 WASTE QUANTITY AT SITE

(Measures of waste quantities must be independent)

- TONS: _____
- CUBIC YARDS: _____
- NO. OF DRUMS: _____

03 WASTE CHARACTERISTICS (Check all that apply)

- A. TOXIC
- B. CORROSIVE
- C. RADIOACTIVE
- D. PERSISTENT
- E. SOLUBLE
- F. INFECTIOUS
- G. FLAMMABLE
- H. IGNITABLE
- I. HIGHLY VOLATILE
- J. EXPLOSIVE
- K. REACTIVE
- L. INCOMPATIBLE
- M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	unknown		
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., State Files, Sample Analysis, Reports)

4-5-84 - Site Investigation

EPA FORM 2070-13(7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TN10

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include species, if known)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TND980515779

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515779

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER (Specify) Basins	Unknown	

04 TREATMENT (Check all that apply)

- ☐ A. INCINERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☒ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☒ A. BUILDINGS ON SITE

06 AREA OF SITE

_____ (Acres)

07 COMMENTS

This is an old sewer treatment plant that Oil Services leased 3 years ago. A company by the name of Tri-Tech operates this plant for them. They treat waste oil. Waste water is discharged to the municipal system and is tested every so often. Oil Services hauls sludge and waste oil off to a licensed treatment facility.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☒ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC

Waste oil is contained in concrete basins.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE ☒ YES ☐ NO

02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4-5-84 - Site Investigation

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: TN | 02 SITE NUMBER: TND980515715

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. 10^{-4} – 10^{-6} cm/sec ☐ B. 10^{-4} – 10^{-6} cm/sec ☐ C. 10^{-4} – 10^{-6} cm/sec ☐ D. GREATER THAN 10^{-4} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE (10^{-4} – 10^{-6} cm/sec) ☐ C. RELATIVELY PERMEABLE (10^{-2} – 10^{-4} cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
_____ (ft)	_____ (ft)	_____	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE		
		SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
_____ (in)	_____ (in)	_____ %		_____ %

09 FLOOD POTENTIAL	10
SITE IS IN _____ YEAR FLOODPLAIN	☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)		12 DISTANCE TO CRITICAL HABITAT (of endangered species)
ESTUARINE	OTHER	_____ (mi)
A. _____ (mi)	B. _____ (mi)	ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:			
COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL STATE PARKS; FORESTS; OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. _____ (mi)	B. _____ (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TX	TXD980575774

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)

	SURFACE	WELL
COMMUNITY	A. ☐	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

	ENDANGERED	AFFECTED	MONITORED
	A. ☐	B. ☐	C. ☐
	D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. _____ (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

☐ COMMERCIAL, INDUSTRIAL, IRRIGATION (Adequate other sources available)

02 POPULATION SERVED BY GROUND WATER _____

03 DISTANCE TO NEAREST DRINKING WATER WELL _____ (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
_____ (ft)	_____	_____ (ft)	_____ (gpd)	☐ YES ☐ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☐ NO	COMMENTS:	☐ YES ☐ NO	COMMENTS:

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION, DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
_____	☐	_____ (mi)
_____	☐	_____ (mi)
_____	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. _____ NO. OF PERSONS	B. _____ NO. OF PERSONS	C. _____ NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION

_____ (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

_____

04 DISTANCE TO NEAREST OFF-SITE BUILDING

_____ (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TND 980 [illegible]

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ☐ AERIAL — 02 IN CUSTODY OF _____ (Name of organization or individual)

03 MAPS ☐ YES ☐ NO — 04 LOCATION OF MAPS _____

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TND980515779

II. CURRENT OWNER(S) / PARENT COMPANY (if applicable)

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER
City of Columbia			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**10 STREET ADDRESS** (P.O. Box, RFD #, etc.)	**11 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**12 CITY / 13 STATE / 14 ZIP CODE**	
Columbia / TN / 38401			

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**10 STREET ADDRESS** (P.O. Box, RFD #, etc.)	**11 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**12 CITY / 13 STATE / 14 ZIP CODE**	

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**10 STREET ADDRESS** (P.O. Box, RFD #, etc.)	**11 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**12 CITY / 13 STATE / 14 ZIP CODE**	

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**10 STREET ADDRESS** (P.O. Box, RFD #, etc.)	**11 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**12 CITY / 13 STATE / 14 ZIP CODE**	

III. PREVIOUS OWNER(S) (List most recent first) / IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**03 STREET ADDRESS** (P.O. Box, RFD #, etc.)	**04 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**05 CITY / 06 STATE / 07 ZIP CODE**	

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**03 STREET ADDRESS** (P.O. Box, RFD #, etc.)	**04 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**05 CITY / 06 STATE / 07 ZIP CODE**	

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**03 STREET ADDRESS** (P.O. Box, RFD #, etc.)	**04 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**05 CITY / 06 STATE / 07 ZIP CODE**	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4-05-84 - Site Investigation

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION
01 STATE: TN | 02 SITE NUMBER: TND980558

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
TRI-TECH	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
WALDRON RD	

05 CITY	06 STATE	07 ZIP CODE
LAVERGNE	TN	

08 YEARS OF OPERATION	09 NAME OF OWNER

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4-5-84 - Site Investigation

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TND980515779

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE / 07 ZIP CODE	

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515??

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	TND980515179

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION *Cite specific references, e.g., state files, sample analysis, reports*

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	TNC980515779

II. ENFORCEMENT INFORMATION

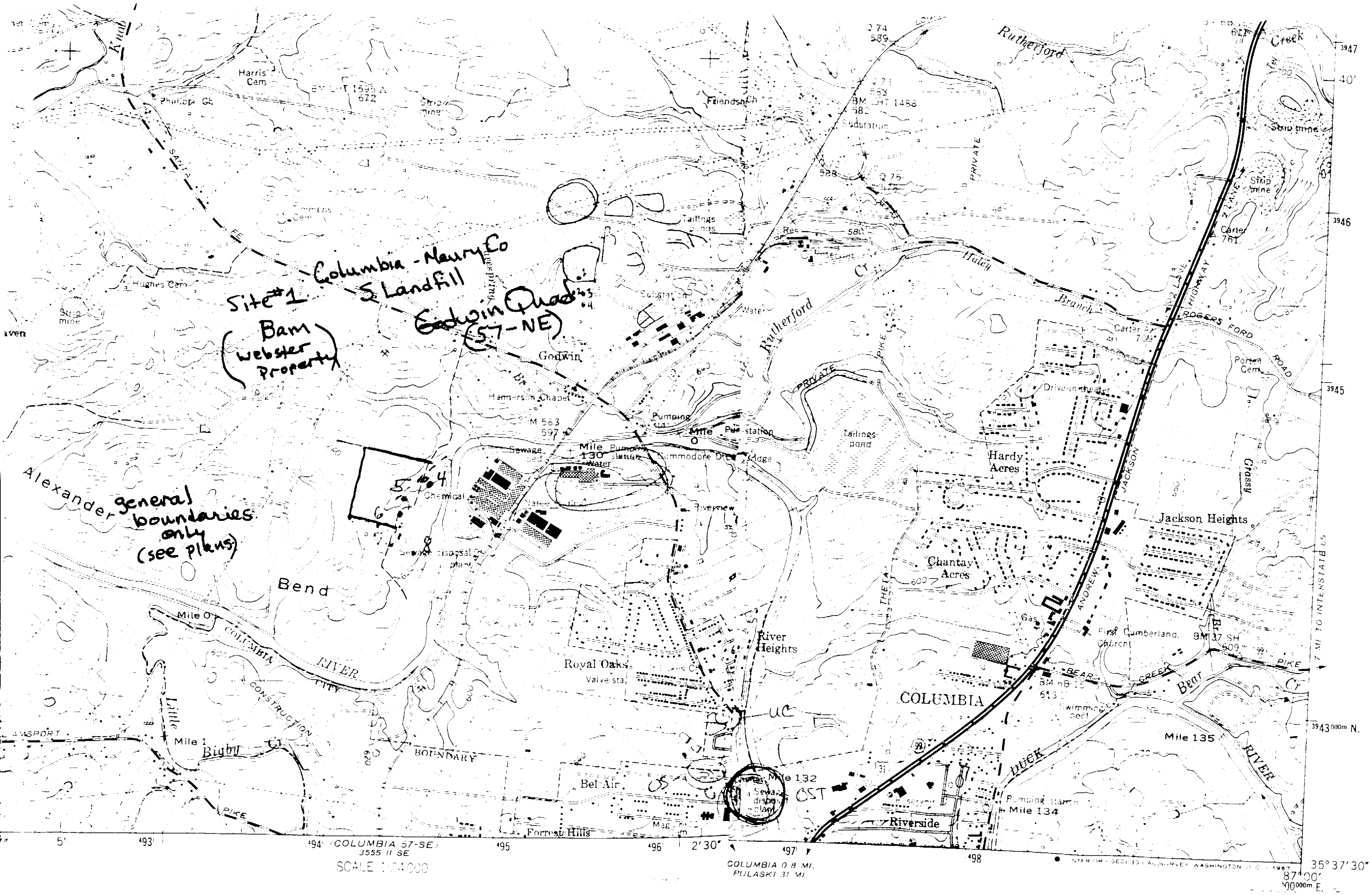
01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

4-5-84 - Site Investigation

EPA FORM 2070-13 (7-81)



Columbia - Maury Co
S Landfill
Godwin Quad
(57-NE)
Site #1
Barn
webster
Property
general
boundaries
only
(see plans)
UC
CST
Harris Cem
Philippi Ch
Friendship Ch
Hughes Cem
Strip mine
Tailings ponds
Godwin
Substation
Hammerstein Chapel
Pumping station
Sewage bed
Chemical
Sewage disposal plant
Alexander
Bend
Mile 0
Mile 1
Mile 130
Mile 132
Mile 134
Mile 135
COLUMBIA RIVER
Little
Bigby
Cr
PIKE
BOUNDARY
Bel Air
Forrest Hills
Royal Oaks
Valve sta
River Heights
Riverview
Commodore Dr
Tailings pond
Rutherford
Cr
Haley
Branch
PRIVATE
PIKE
Hardy Acres
Chantay Acres
Drive-in theater
JACKSON
HIGHWAY
Jackson Heights
Grassy
ROGERS FORD ROAD
Porter Cem
Carter
First Cumberland Church
BEAR
CREEK
Bear
Cr
COLUMBIA
Swimming pool
DUCK
RIVER
Riverside
Pumping station
Gas
Strip mine
Creek
7 MI. TO INTERSTATE 65
COLUMBIA 57-SE
3555 II SE
SCALE 1:24 000
COLUMBIA 0.8 MI.
PULASKI 31 MI.
2′30″
35°37′30″
87°00′
3943000m N.
3945
3946
3947
40′
493
494
495
496
497
498

68-37 Burt

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	D980515779

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Oil Service Co./Treatment Plant	408 Santa Fe Pike				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Columbia	TN	38401	Maury	119	06

09 COORDINATES LATITUDE: 35 37 38. LONGITUDE: 087 02 15.

10 DIRECTIONS TO SITE (Starting from nearest public road)

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)		
President - Kenneth Harris Oil Services Co.	Box 1203		
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**
Columbia	TN	38401	(615)331-4999
07 OPERATOR (If known and different from owner)	**08 STREET** (Business, mailing, residential)		
09 CITY	**10 STATE**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**
			( )

13 TYPE OF OWNERSHIP (Check one)

☑ A. PRIVATE ☐ B. FEDERAL: ______ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: ______ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ______ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☐ YES DATE: / / (MONTH DAY YEAR)
☐ NO

BY (Check all that apply) ☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR ☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: ______ (Specify)

CONTRACTOR NAME(S): ______

02 SITE STATUS (Check one) ☐ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: 1930 (BEGINNING YEAR) — (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Water soluble oils

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☑ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
				( )
04 PERSON RESPONSIBLE FOR ASSESSMENT	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE**
Randall R. S[illegible]	SWM	TN Dept. of H[illegible]	(615)74[illegible]-[illegible]37	12 [illegible] 87

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	D980515779

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A SOLID
- ☐ B POWDER, FINES
- ☐ C SLUDGE
- ☐ D OTHER (Specify) _____
- ☐ E SLURRY
- ☑ F LIQUID
- ☐ G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS _____
- NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply) None

- ☐ A TOXIC
- ☐ B CORROSIVE
- ☐ C RADIOACTIVE
- ☐ D PERSISTENT
- ☐ E SOLUBLE
- ☐ F INFECTIOUS
- ☐ G FLAMMABLE
- ☐ H IGNITABLE
- ☐ I HIGHLY VOLATILE
- ☐ J EXPLOSIVE
- ☐ K REACTIVE
- ☐ L INCOMPATIBLE
- ☐ M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
X OLW	OILY WASTE	2.5×10^5	Gallons	Treat 1.0×10^5 Gallons/Day
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
7					

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

County files (60-37) at TN. Dept. of Health and Environment, Nashville Central Office (Division of Solid Waste Management)

EPA: Process Code Report

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
TN	D980515779

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

7

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
TN	D980515779

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

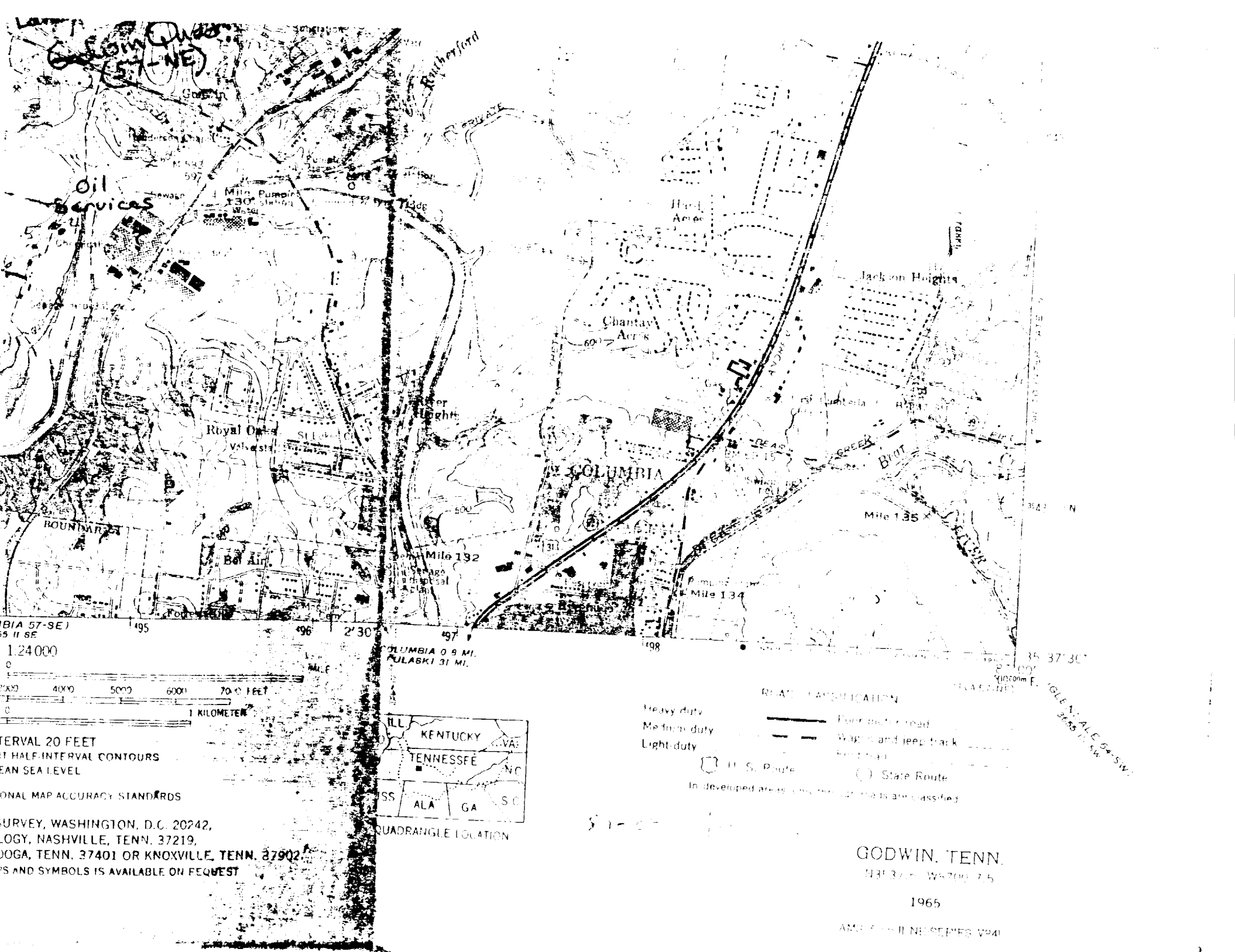
7

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)



INTERVAL 20 FEET
HALF-INTERVAL CONTOURS
MEAN SEA LEVEL

ONAL MAP ACCURACY STANDARDS

SURVEY, WASHINGTON, D.C. 20242,
LOGY, NASHVILLE, TENN. 37219,
OOGA, TENN. 37401 OR KNOXVILLE, TENN. 37902.
S AND SYMBOLS IS AVAILABLE ON REQUEST

GODWIN, TENN.

1965